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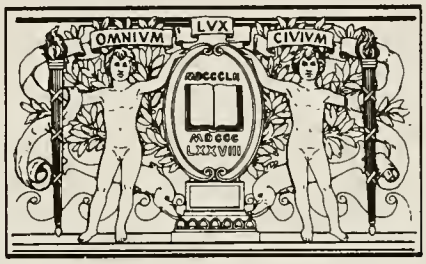

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Wentworth Institute of Technology
Boston Campus Master Plan

Sasaki Associates, Inc.
Anthony Blackett
McDermott / O'Neill & Associates

April 1991

Wentworth
Institute of Technology

April 25, 1991

Mr. Gerard Kavanaugh
Boston Redevelopment Authority
1 City Hall Square
Boston, MA 02201

Dear Mr. Kavanaugh:

Attached for your review are two (2) copies of Wentworth Institute of Technology's Master Plan Draft Submittal.

We would appreciate meeting with you at your earliest possible convenience to discuss your comments. May we suggest that this be a joint meeting that includes BTD and ONS? We have distributed copies to Ed Burke at ONS and Andy McCough at BTD. We are eager to schedule a meeting with the PZAC prior to the advent of mid-summer when vacations may make scheduling difficult.

Carole Pelletier of McDermott/O'Neill and Sandra Pascal of Wentworth Institute of Technology will be coordinating the meeting schedules. We appreciate your interest and attention and look forward to beginning the community review process.

Sincerely,

John P. Heinstadt
Vice President for
Business & Finance

/vm
encls.
cc: Carole Pelletier, McDermott/O'Neill
James Doolin, Sasaki Associates

Wentworth Institute of Technology
Boston Campus Master Plan

DRAFT

Sasaki Associates, Inc.
Anthony Blackett
McDermott / O'Neill & Associates

April 1991

WENTWORTH INSTITUTE OF TECHNOLOGY
FIVE-YEAR PLAN
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I. SUMMARY

Introduction

The Wentworth Institute of Technology Master Plan has been prepared in accordance with the scope of the Boston Redevelopment Authority's "Institutional Master Plan Requirements" document. In essence the requirements specify that the plan shall project five years into the future and describe the projects proposed by the institution. This description of projects is to include the proposed use, scale and character, timing and schedule for implementation and benefits or impacts associated with the projects. In a larger context, the plan requirements include analysis of pedestrian and vehicular circulation, urban design, institution needs and mission and a review of existing property and facilities. Completion of an Institutional Transportation and Parking Management and Mitigation Plan is specifically identified, in the BRA requirements.

Beyond the five-year planning horizon the "Institutional Master Plan Requirements" include a discussion of long-term goals and direction the institution envisions within and beyond a ten-year planning horizon.

Preparation of the Draft Master Plan began in the summer of 1989 when the Wentworth Institute of Technology initiated a detailed analysis of existing campus conditions and space program needs. That phase of analysis was completed at the end of 1989 and was documented in an Inventory Report (December 1989). During that period and the following year the Institute initiated meetings with the Boston Redevelopment Authority (BRA), the Office of Neighborhood Services (ONS) and the Boston Transportation Department (BTD) in an effort to address city concerns and establish a process for community review. During those meetings it was directed that the Mission Hill Planning and Zoning Advisory Committee (PZAC) would be the formal community review body.

This Draft Master Plan represents the Institute's submittal to the BRA and community for review and approval. The projects and proposals contained in the Plan have undergone much internal discussion and debate at the Institute. Wentworth, through the City and community review process, believes that this Draft Master Plan includes planning principles and projects that will prove beneficial to the community by addressing needs and goals that are shared by the Institute and the adjacent neighborhoods.

Five-Year Plan

The Five-Year Plan for Wentworth proposes a certain amount of renovation (47,619 s.f.), new construction (72,972 s.f.) and site improvements on-campus. These activities address needs fundamentally related to existing space shortfalls, quality of educational and support facilities, accreditation of academic programs and circulation of people and vehicles on and adjacent to the campus.

During the five-year planning horizon, enrollment is planned to remain stable at approximately 4,000 total students and the resident student bed count is to remain at 902 beds. Thus, the plan to renovate existing space or build new space is primarily in response to issues of quality related to the Institute's physical plant, rather than the need to provide additional space for more students. A major initiative of the Five-Year Plan is to provide for outdoor field space on-campus that can serve a variety of needs, purposes and user groups.

The Plan proposes several projects that deal with site improvements related to pedestrian circulation on-campus and connections across intervening public streets, vehicle access to campus entry points and parking lots and landscape conditions at internal courtyard and perimeter campus locations. The Plan recognizes that the same basic systems of circulation will remain in place, however, the Plan strives to clarify and enhance pedestrian routes within the campus and from nearby mass transit facilities. Thus, some campus entry points have been realigned and parking has been redistributed in response to open space initiatives.

The Five-Year Plan essentially represents a consolidation and focus on existing facilities and existing properties. It does not include geographic expansion or significant expansion to the building square footage at the Institute.

Five-Year Plan Projects

A brief summary of the proposed Five-Year Plan projects follows. The Illustrative Plan, *Figure 1*, shows the Five-Year Plan in the context of the overall campus.

1. College of Design and Construction (CDC)

Renovation and addition to the existing Annex Building complex to provide for the type and amount of space necessary for accreditation of the Bachelor of Architecture Program and facilities for other existing CDC programs.

Phase IA	16,125	sf renovation
Phase IB	8,754	sf renovation
	72,972	sf new construction
Total	24,919	sf renovation
	72,972	sf new construction
	97,891	sf total project

2. *Playfields and Recreational Open Space*

Introduction of three acres of multipurpose fieldspace on the "Triangle" parcel bordered by Huntington Avenue/Parker Street and Ruggles Street. Includes field area for soccer, softball, football and informal play, parking for approximately 40 vehicles on-site and support facilities (walkways, lighting and fencing) are included. Displaces 150 of the 190 parking spaces that currently exist and those would be relocated to the Parker Street Lot.

3. *Ruggles Street Campus Arrival Zone Redesign*

Realignment and redesign of existing two-way drive near Huntington Avenue to a one-way system located towards midblock. Circulation improved and conflicts reduced by moving entry away from Huntington Avenue. Connects parking lots on both sides of Wentworth Hall to Vehicle entry/exit system and provides a better approach and setting to Wentworth Hall, the public "front door" to campus.

4. *Edwards/Rogers Hall Feasibility Study*

Evaluate existing student residence to determine feasibility of maintaining the structure as residence hall, or adapting the facility to another use, or demolition.

5. *West Lot Pedestrian Improvements*

Introduction of a clearly defined walkway across West Lot from Edwards/Rogers Hall. Reduces pedestrian/vehicle conflicts and enhances on-campus walking quality. Initiate discussions with Massachusetts College of Art to provide pedestrian connection across their existing parking lot to reinforce use of the signalized crossing of Huntington Avenue at Tetlow Street and connect Baker Hall site directly back to campus core.

6. Decommission Halleck Street and Mindoro Street

Consolidates land area and eliminates outdated streets not used for through traffic. Gains ability to plan area comprehensively and requires petition to the City of Boston.

7. Building Renovations

Renovation of interior portions of the Ira Allen Building for physics labs and faculty offices and Beatty Hall to upgrade the bookstore, board room and faculty cafeteria and lounge. Total square feet effected = 22,700.

Wentworth Institute of Technology
Boston Campus Master Plan

Illustrative Plan
Figure 1

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Five-Year Program

1. College of Design and Construction
2. Playfields and Recreational Open Space
3. Ruggles Street Campus Arrival Zone Redesign
4. Edwards / Rogers Hall Feasability Study
5. West Lot Pedestrian Improvements
6. Decommission Halleck Street and Mindoro Street
7. Building Renovations

Sasaki Associates, Inc. *Campus Planning & Design*
Anthony Blackett *Space Programming*
McDermott / O'Neill & Associates, Inc. *Development Consultant*
April, 1991

II. INTRODUCTION

A. THE WENTWORTH PHILOSOPHY AND MISSION

Wentworth Institute of Technology is widely recognized as a national leader in engineering technology which provides Wentworth with a unique niche among the academic institutions of Boston. Wentworth Institute of Technology's mission is to provide its students with the highest quality education possible in the field of engineering technology and associated technical disciplines, at an affordable cost. Study at Wentworth stresses practical applications to the problems of business, industry and science. Strong emphasis is placed on studio and laboratory work in addition to traditional classroom study.

Wentworth has a Cooperative Education (Co-op) program available to all degree candidates, however, participation in the Co-op Program is a requirement for all Bachelor degree programs. The success of this program, which provides on the job experience, is demonstrated by the fact that between 85-100% of the participants enter the work force directly from graduation into positions within their area of study.

As part of Wentworth's educational mission, the Institute actively works to foster an interest in the sciences and technology in young students in area high schools and grade schools. This is accomplished through outreach programs conducted by Wentworth in conjunction with other local institutions and secondary schools.

The Institute is comprised of four divisions: 1) The College of Design and Construction (CDC); 2) The College of Engineering and Technology (CET); 3) The College of Arts and Sciences (CAS); and 4) The Division of Management Sciences (DMS). A total of ten programs are offered leading to the Bachelor of Science degrees in Engineering Technology, nine programs leading to a degree in Associate in Engineering Degrees, eleven leading to the Associate in Applied Science, and two Certificate of Graduation programs. Majors are offered in over twenty-five technical disciplines.

As of the fall of 1990, Wentworth Institute of Technology had a total enrollment of 3,904 students, 2,959 of whom are full-time day students, 461 are evening degree candidates and 484 are students in Weekend College for the baccalaureate degree. This represents an overall enrollment decline of almost 3 percent from the total enrolled (4,021) in the fall of 1989. Since the fall of 1989, the decline has been in full-time day students, whereas the part-time evening and weekend enrollments actually increased.

Students in Wentworth's College of Design and Construction and the College of Engineering and Technology comprise approximately 90% of the Institute's total enrollment. Over the next five years, it is anticipated that Wentworth will experience some shifts in enrollment. Enrollment in the College of Design and Construction is expected to decline somewhat and enrollment in the College of Engineering and Technology is anticipated to increase by 33%. The College of Engineering and Technology is expected to be able to absorb the increases in enrollment, since total enrollment in the past has been up to 44% larger than current enrollment and has been housed within existing classroom and laboratory space without significant overcrowding. Boston residents comprise approximately 20% of Wentworth Institute's student population.

The Institute strives to attract and educate a diverse student body. Recruitment efforts are made which target women and under-represented groups, in order to increase their participation in the technical professions. Additionally, Wentworth provides technical education to students from over 60 countries.

A significant portion of the student body receives financial aid. The Institute has worked to develop scholarships and the Cooperative Education program to provide opportunities for students who may not be able to afford college otherwise.

In summary, the Institute's vision for the future has three key areas of focus: the campus facilities, the composition of the student body, and the academic programs. First, Wentworth is seeking to consolidate its campus within the existing outer boundaries. Second, Wentworth will maintain its current enrollment of approximately 4,000 full time students, while shifting its composition somewhat, through increasing the portion of the student body living on campus and decreasing the number of commuter students. The Institute has set a long-term goal of having its resident student population represent 50% of total enrollment, an 18% increase from the present 32%. Given demographic trends, Wentworth is also focusing recruitment efforts on a more nationally diverse student population. Third, Wentworth has as one of its long-term objectives to become a polytechnic institute, through expansion of certain areas of technological study and increasing the number of courses offered in the humanities.

B. WENTWORTH IN THE BOSTON ECONOMY

Wentworth is an important educational and training resource to the City as Boston continues to focus on new, knowledge-based economies as future growth sectors for the City. Many of these economies are dependent upon the City's institutional infrastructure. Wentworth Institute trains a large number of professionals in such areas as technology, civil engineering, architecture and construction management which will be key to future projects for the City. Additionally, Wentworth trains professionals in the environmental applications of engineering, a field that is growing in importance as large urban projects of increasing magnitude and complexity are undertaken. Wentworth provides the City of Boston with the invaluable resource of trained professionals all of whom have on the job experience.

Wentworth has historically provided retraining programs in conjunction with local business to provide workers with new marketable skills. These programs will continue and help improve the competitiveness of local business and industry.

In addition to training professionals for employment in the emerging growth economies of the City, Wentworth is working toward other important City objectives. The Institute has undertaken efforts to foster an interest in the sciences among high school and middle school students in Boston, particularly women and other under-represented students. These programs, such as the program with Boston Technical High School, demonstrate the Institute's active efforts to work with Boston residents to promote interest in the sciences and establish relationships with area high schools and youth programs. Over the past several years, the Institute has developed Cooperative Education and training programs and received grants to develop special programs to accomplish these shared objectives. These programs are outlined in Section IV of this document, entitled Community Benefits.

C. HISTORY

The Wentworth Institute of Technology was chartered in 1904 in accordance with the will of Arioch Wentworth, for the express purpose of "providing education in the mechanical arts". In accordance with Mr. Wentworth's will, land was purchased for the construction of the Institute. The site selected was at the corner of Huntington Avenue and Ruggles Street in Boston. Construction began and Wentworth Institute officially opened on September 25, 1911, with an entering class of 224 day and 467 evening students. Courses of instruction included carpentry and building, electrical wiring, plumbing, machine work, pattern-making, foundry practice, machine construction and tool design, and electrical construction and operation.

Both day and evening courses were provided by Wentworth since the outset, in order to accommodate as many men seeking to further their education as possible. The original curriculum provided one-year apprenticeship courses for those seeking to become skilled workmen and two-year courses for those wishing additional experience as

superior workmen, master mechanics or foremen. Evening courses provided men currently working in the industry with the opportunity to increase their efficiency or aid in career advancements.

Over the next forty years, Wentworth Institute continued to expand and formalize its curriculum. In 1956, it became an accredited junior college, providing students with an Associate Degree in Engineering as well as conducting research in engineering and related fields. After continued expansion of its academic programs, in 1972 Wentworth College of Technology was chartered by the Commonwealth of Massachusetts as a senior college of technology with the right to grant Bachelor of Science in Engineering Technology degrees. In 1977, Wentworth College of Technology merged with Wentworth Institute and the name was changed to Wentworth Institute of Technology. Wentworth Institute of Technology as it is now has changed a great deal since its inception. What began as a small school for the mechanical arts with a student body that was all-male has become an institute of engineering technology of national stature with a diverse student body. One goal of the Institute that was established when it was founded in 1904 is the commitment to providing an affordable education in engineering technology and associated technical studies.

D. WENTWORTH WITHIN THE COMMUNITY

Wentworth Institute of Technology has been a member of the community since the first campus building was constructed and occupied in 1911. As a long-time member of the Mission Hill neighborhood, the Institute has worked along with its neighbors to improve the quality of life in the community in a variety of ways, including educating students providing youth sports and education programs, participating in neighborhood maintenance and security efforts and providing jobs on campus.

Wentworth makes a considerable economic commitment to the City and the residents of Mission Hill. Currently, Wentworth employs 410 people in full-time/part-time regular positions of these 130 are Boston residents. In addition, 120 adjunct employees work as evening and weekend College instructors. In terms of direct economic contributions to the City of Boston, the Institute infuses over $11.2 Million in salaries and wages annually, of which approximately 20% go to employees who are City residents. In addition, Wentworth spends approximately $2,000,000 in the local community via service contracts and purchases of goods and services from community businesses and local merchants. This does not include the amount of local spending generated by students and employees.

III. FIVE-YEAR PLAN

A. OBJECTIVES

Wentworth recognizes three significant opportunities that have resulted from master planning efforts: the preparation of a plan to guide the Institute's five-year development, the opportunity to contribute towards the coherent planning of the community adjacent to and inclusive of the campus, and the entitlement to submit projects within the Plan to the City for approvals. The Institute is supportive of a participatory process because the Institute and the community are physically interdependent, sharing the street system, transportation systems, open space and other resources. The nature and quality of development within the community and on campus will influence each other and benefits will accrue if shared and diverse concerns are identified and addressed.

The Wentworth Institute of Technology Five-Year Plan has been prepared with several key objectives in mind. They are:

- *Establish a strong vision for the Master Plan that aspires to fully implement the mission of the Institute and is reflective of both program initiatives and the educational traditions of the Institute*

- *Support and enhance existing and planned academic programs primarily through renovation and reprogramming of existing facilities and, if necessary, a modest amount of new construction*

- *Accommodate the short-term priority program elements in concert with the goals of fundraising campaigns and consistent with the strategies for longer term program objectives*

- *Consolidate campus facilities within existing external boundaries*

- *Provide adequate on-campus student housing in terms of quality, amount and type, in order to meet the needs of students and prevent any undue demands on the residential areas of Mission Hill and other surrounding neighborhoods*

- *Improve traffic circulation and efficiency of existing parking supplies and encourage student, staff and faculty use of mass transportation in order to minimize the use of private automobiles to campus*

- *Incorporate community needs and planning objectives to the extent possible during the master planning process*

- *Support the economic development initiatives of the City by continuing to train young adults and older non-traditional students in the fields of engineering and technology*

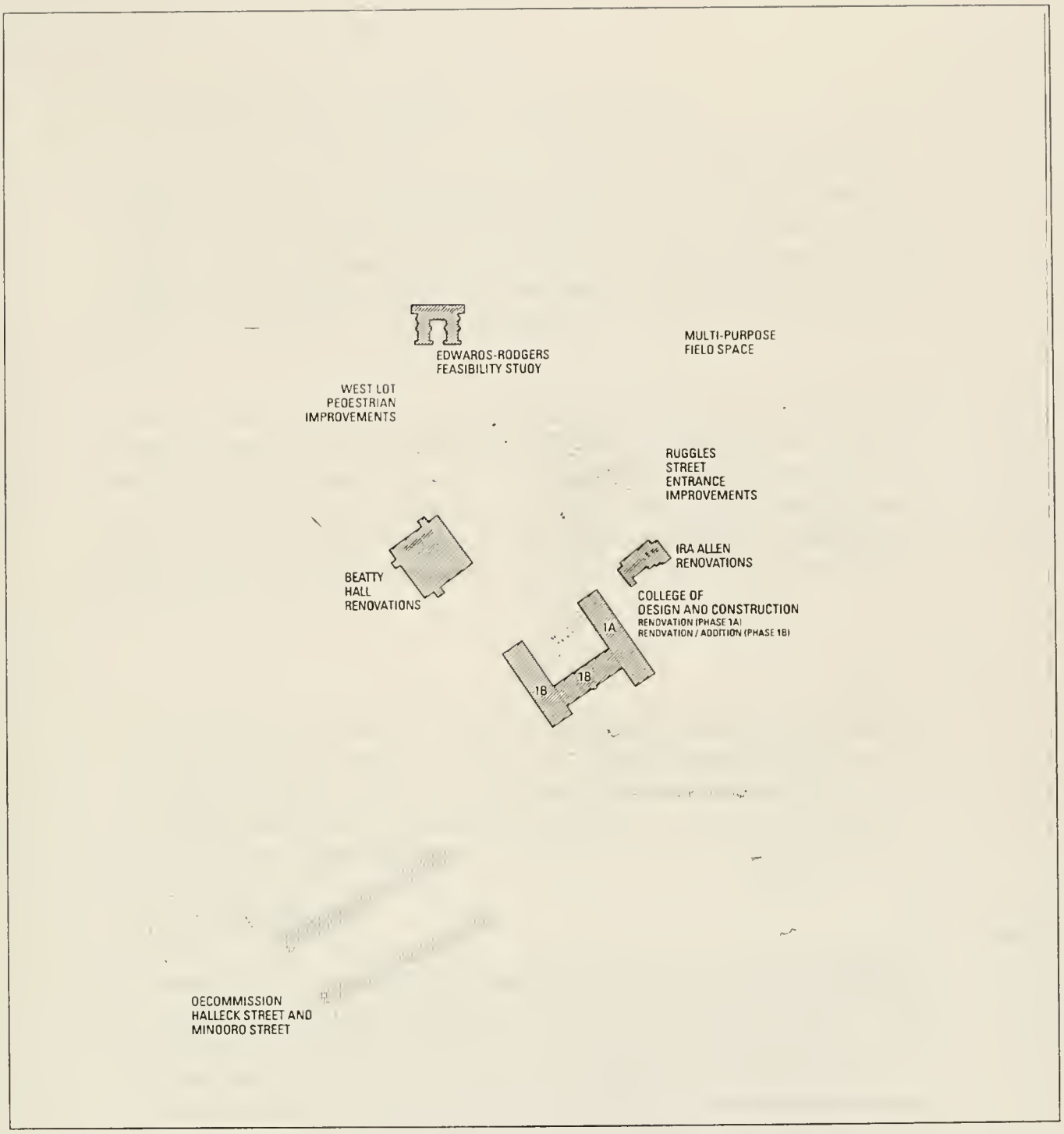
- *Support initiatives that provide opportunities in technological education for underrepresented populations*

- *Continue to improve the physical appearance and functioning of the campus and adjacent public environment and provide useable open space and safe pleasing pedestrian access to all areas of the campus*

B. PROGRAM

The proposed development on the Wentworth campus over the next five years is primarily focused on rehabilitation, renovation and upgrading of existing facilities, with selective additions to existing buildings. The five-year program is not driven by enrollment increases, since none are expected, but the program addresses facility quality, existing academic program needs, the provision of useable open space and improving the pedestrian and vehicular circulation systems. The proposed open space and circulation improvements in particular will offer the opportunity for enhancing the adjacent public environment of streets, sidewalks and open space.

Many of Wentworth's buildings are quite old, built during the first decades of the twentieth century, and house programs that require constant modernization to remain current. Classrooms, laboratories, drafting studios and faculty offices need to be updated to incorporate new equipment and techniques and to meet standards for accreditation and to maintain competitive levels of quality. Some of the existing student housing facilities will no longer be suitable for continued occupation by students without substantial upgrading. The lack of on-campus recreational field space severely limits student outdoor recreational activities and constrains the ability of the Institute to attract new students to maintain enrollments. Library space is limited and approaching capacity and administrative space falls far short of that provided at comparative institutions. As a result, the Institute has planned for the renovation of certain facilities and a modest addition (new construction) to the Annex Building to meet Wentworth's needs in the near-term future. *Figure 2*, The Five-Year Plan, illustrates the location of the proposed projects that are described in the following section.



Wentworth Institute of Technology
Boston Campus Master Plan

Five-Year Plan
Figure 2

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Sasaki Associates, Inc. *Campus Planning & Design*
Anthony Blackett *Space Programming*
McDermott / O'Neill & Associates, Inc. *Development Consultant*

April, 1991

1. College of Design and Construction Renovation and Expansion

Wentworth's College of Design and Construction (CDC) is an integral part of the Institute, and has been for the past eighty years. At present, the CDC offers majors in architecture, construction management, architectural engineering technology, building construction, interior design, and facilities management, as well as certificate programs in construction drafting and construction technology. The CDC programs are housed in the Annex (Buildings 20, 21, 22, 23), a complex of older buildings acquired from the City.

A primary component of the Five-Year plan is to secure accreditation for a Bachelor of Architecture degree which would be the only such program in Massachusetts and the second accredited Bachelor of Architecture in New England. In order to meet the program and facilities requirements of the National Architecture Accreditation Board (NAAB) and to provide interior circulation and systems improvements to the building complex, two distinct phases of renovation/expansion of the Annex in the Five-Year Plan are proposed as follows:

- CDC Phase IA

  The Initial phase includes a 16,125 s.f. renovation of existing space in the top floor of the north wing of the Annex (Building 21). This will provide for architectural drafting studio space which is necessary for accreditation requirements. Construction is scheduled to start in the spring of 1991 with completion by the Spring of 1992 for NAAB review on campus.

- CDC Phase IB

  The next steps to the updating and improvements to the Annex include the renovation of 6,050 s.f. and addition of 10,000 s.f. to the top floor of the south wing (Building 23) and renovation of 1,644 s.f. on the first floor of Building 21. Concurrently, construction of a new four-level connector building (62,972 s.f.) would take place. This new building would join the north and south wings, create internal courtyards, reconcile existing internal circulation limitations between buildings in the complex, and would require the demolition of the existing (but inoperable) boiler plant building (Building 20). The 10,000 s.f. addition to Building 23 represents an extension of the existing roofline for the entire length of the building. Renovation of 1,040 s.f. of circulation and classroom space in Building 22 would complete this phase of the CDC project. In total, Phase IB includes 72,972 s.f. of new construction and 8,754 s.f. of renovation.

In total, CDC Phase IA and CDC Phase IB include 24,919 s.f. of renovation and 72,972 s.f. of new construction. The preliminary budget estimate for completion of both Phase IA and IB is $6.0 million. It should be noted that in the long-term, beyond the five-year horizon, Wentworth intends to continue the rehabilitation of the balance of the existing space in the Annex complex, which totals approximately 100,750 s.f.

An alternative to renovation of the Annex that was tested was the construction of a new building to house the CDC programs. After study, this alternative was rejected because of the following:

- required the displacement of existing parking supplies on campus that could not be adequately reconciled
- considerably more expensive to construct
- more difficult to phase construction and facility would not be available for the spring 1992 accreditation evaluation
- no other program identified for the Annex
- the Annex location was preferable to other potential building sites

2. *Playfields and Recreational Open Space*

Currently, the Institute does not have any on-campus field space that can be programmed for recreation/athletic activities. This significantly constrains opportunities for students to participate in informal play, intramurals and even intercollegiate competition. Further, open space is at a premium in this densely developed urban environment. Outdoor recreational opportunities for students and community residents alike are mostly provided by existing public open space facilities off-campus.

The Institute proposes in the Five-Year Plan to introduce recreational field space on the so called "Triangle" parcel. This site is three acres in area and is bordered by Parker Street, Ruggles Street and Huntington Avenue. Currently the site of a Wentworth parking lot, the introduction of field space on this site provides the following:

- multipurpose athletic/recreational open space
- preservation of the traditional connection between Wentworth Hall and Museum of Fine Arts, reinforcing the Institute's "front door" presence on Huntington Avenue
- reduced pressure on adjacent off-campus public open space resources
- removal of the bulk of parking spaces from this prominent site
- improved the urban design qualities along the Huntington Avenue corridor

The proposed project includes programmable field space (soccer, softball, football, general recreation) and associated site improvements including fencing (perimeter and backstops), landscaping and pedestrian walkways connecting back to Wentworth Hall. Because of the limited site area, the differing venues will be provided for on playing areas that overlap. An estimated forty parking spaces will continue to be provided along the Parker Street edge and will be entered/exited from the existing curb cut on Parker Street. The displaced parking will be relocated to the Parker Street lot. Preliminary budget estimates for this project range from $1.0-$1.4 million depending on the specific design and program elements.

Wentworth anticipates that these field space improvements will be available on a limited basis to the community by coordinating the Wentworth schedule of use with identified community programs.

Alternatives to accommodating the needed field space on the Triangle property, included locating fields east of Parker Street/south of Prentiss Street, or doing without field space on-campus. The latter option was deemed undesirable by the Institute's administration because of heavy student demand and the role of field space in student recruitment efforts. The alternative site between Parker Street and Prentiss Street had numerous constraints to implementing field space improvements in the short-term including lack of adequate site area without building demolition, parking displacement (both Wentworth affiliates and that leased to MASCO) and/or required street decommissionings. As a result, this option was not pursued for near term field space needs.

3. *Ruggles Street Campus Entry Redesign*

The existing campus access driveway on Ruggles Street is heavily used by faculty, staff and visitors in route to or leaving the West Lot area. It is located prominently in front of Wentworth Hall and very close to Huntington Avenue which causes vehicular turning movement conflicts between exiting/entering vehicles and those vehicles travelling along Ruggles Street. This is particularly true for left turn movements in the AM and PM peak hours.

The Five-Year Plan proposes to create separate campus entry and exit points along Ruggles Street by relocating the existing driveway further away from Huntington Avenue and making it ingress only. A separate (one-way) exit driveway would be added closer to Parker Street. As indicated on *Figure* 2, this new entry/exit system would link the West Lot with the lot east of Dobbs Hall in a single system. In addition, visitor drop-off and short-term curbside parking would be available directly in front of Wentworth Hall where the Institute's "public" functions are located. On-campus walkways would also be adjusted in front of Wentworth Hall in response to the driveway redesign.

This project provides for improvements in both the on-campus and off-campus vehicular circulation patterns. In addition, the movement of the existing driveway away from Huntington Avenue reduces the potential for vehicular conflicts with pedestrians coming from the Green Line stop or from housing across Huntington Avenue. The symmetrical alignment of the driveways with Wentworth Hall also reinforces the visual stature of this very prominent building. If possible, it would be desirable to have the timing of these proposed improvements coordinated with the proposed widening of Ruggles Street. Preliminary budget projections indicate a range of $250-$350,000+ which may vary considerably dependent on the exact program and design.

An alternative of a single two-way driveway was considered for the Ruggles Street entrance but was not considered as appropriate as the recommended design because conflicting entry/exit movements would not be separated, and it would afford less opportunity to reinforce the positioning and prominence of Wentworth Hall.

4. Edwards and Rogers Hall Feasibility Study

Edwards/Rogers Hall is in need of major rehabilitation in order to continue to function as a student resident facility. Located prominently on the south side of Huntington Avenue, preliminary evaluations of this sixty-seven year old facility indicate outdated power, plumbing and heating systems, along with the need to substantially upgrade the interior living and circulation spaces. No elevator exists in this 6-story building.

The Five-Year Plan proposes that Edwards/Rogers Hall be specifically analyzed and tested for three options: rehabilitation for continued use as student housing, rehabilitation for another Institute use, and demolition. The plan recommends a feasibility study including these parameters:

- evaluate structural and building systems
- define program options for student housing, academic, and administrative uses
- prepare pre-schematic accommodation plans for optional uses
- prepare preliminary cost estimates for alternative scenarios
- recommend preferred option for Edwards/Rogers

This feasibility study is proposed to be completed by the end of the 1991 calendar year. At that time a specific recommendation would be available as to the planned disposition of this building and be incorporated into the annual update of the master plan for Wentworth where action steps would be identified and evaluated.

5. *West Lot Pedestrian Improvements*

Pedestrian improvements are needed to provide better connection of those Institute facilities north of Huntington Avenue to the campus academic/administrative core. Two existing conditions are constraining: the pedestrian connection across West Lot is poorly defined as an extension of the walkway adjacent to the west facade of Rogers/Edwards Hall; and, the Massachusetts College of Art parking lot that intervenes between the West Lot and Huntington Avenue blocks the pedestrian "desire line" from the Tetlow Avenue crossing on Huntington Avenue.

The Five-Year Plan proposes two strategies to improve pedestrian conditions and the connections for facilities north of Huntington Avenue to the campus core.

First, the Five-Year Plan recommends the introduction of a walkway through West Lot that is defined by curbing, landscaping, signs and lighting. This is proposed as an extension and upgrading to the existing walkway along the west facade of Edwards/Rogers. This will clearly define the pedestrian path and provide improved safety in the West Lot.

Second, the Five-Year Plan recommends initiating discussions with the Massachusetts College of Art to consider options to provide for a pedestrian connection across their existing parking lot. This would encourage pedestrians to use the signalized crossing of Huntington Avenue at Tetlow Street by providing a more direct connection from that crossing to the campus core. In addition, it would provide a better connection to the Baker Hall site, with its high volume of pedestrian traffic moving to and from student housing and parking.

Pedestrian improvements across West Lot could be initiated within a year depending on funding availability (preliminary budget estimate is $60-$100,000) and the results of discussions with Mass College of Art. Other improvements or joint planning efforts with Mass College of Art are not predictable as to schedule, however, discussions have been initiated.

6. *Decommission Halleck Street and Mindoro Street*

Currently Halleck Street and Mindoro Street do not provide a public circulation function as there is no significant traffic on these streets. In fact, their only function is to allow perimeter access to Wentworth property leased to MASCO for surface parking.

In an effort to consolidate property and eliminate the constraints of the site geometry imposed by this outdated street pattern, the Five-Year Plan proposes the decommissioning of Halleck Street and Mindoro Street. When implemented, this would provide for a consolidated parcel with a geometry and dimensions that can support efficient, securable, site development for a variety of uses. Options could include the redesign of existing parking lots to a more efficient and landscaped condition, as well as in the longer term, consideration by Wentworth for more significant levels of investment for such activities as indoor and outdoor recreation or structured parking.

7. Building Renovations

Ira Allen Building - This building is proposed to undergo interior renovations to accommodate physics labs and faculty offices. The existing physics labs in Wentworth Hall (3rd floor) are outdated and poorly located in relation to the faculty who use them. The renovation of Ira Allen represents an opportunity to provide properly designed, up to date labs and consolidate faculty offices within the same building. Some of the existing classrooms will be maintained in Ira Allen and consideration given to using the space vacated in Wentworth Hall for temporary classrooms (if needed) or administrative space. Alternatively, it is planned that the proposed renovation of the CDC make additional classroom space available which could address those displaced in Ira Allen.

This project has a preliminary budget estimate of $400,000 and totals approximately 16,500 square feet of renovated space. Renovation work is planned to start during the Summer of 1991.

Beatty Hall - The renovation of portions of this multipurpose building propose to address existing needs for student services, faculty and Board of Trustees activities and building climate control.

As part of this project the bookstore is proposed to be upgraded for better lighting, circulation and merchandise display. This will effect approximately 3,000 square feet of space. No firm budget estimates have been made but will be developed as the project advances to concept design.

The Board of Trustees room and faculty cafeteria and lounge area are proposed to be substantially renovated. The existing configuration of these spaces is inefficient and not appropriate for the varied functions which are held here. This portion of the project totals approximately 3,200 square feet and a preliminary budget of $340,000 has been established.

Beatty Hall is currently not air conditioned. To protect valuable computer resources and improve the functioning of Beatty Hall, the top two floors of this building will be retrofitted for air conditioning. Budget estimates are currently being developed for this project.

In total, the proposed renovations in Beatty Hall will cover an estimate of 6,200 square feet. Renovations are planned to start in the Summer of 1991.

C. LAND AND BUILDING RESOURCES

1. Campus Location

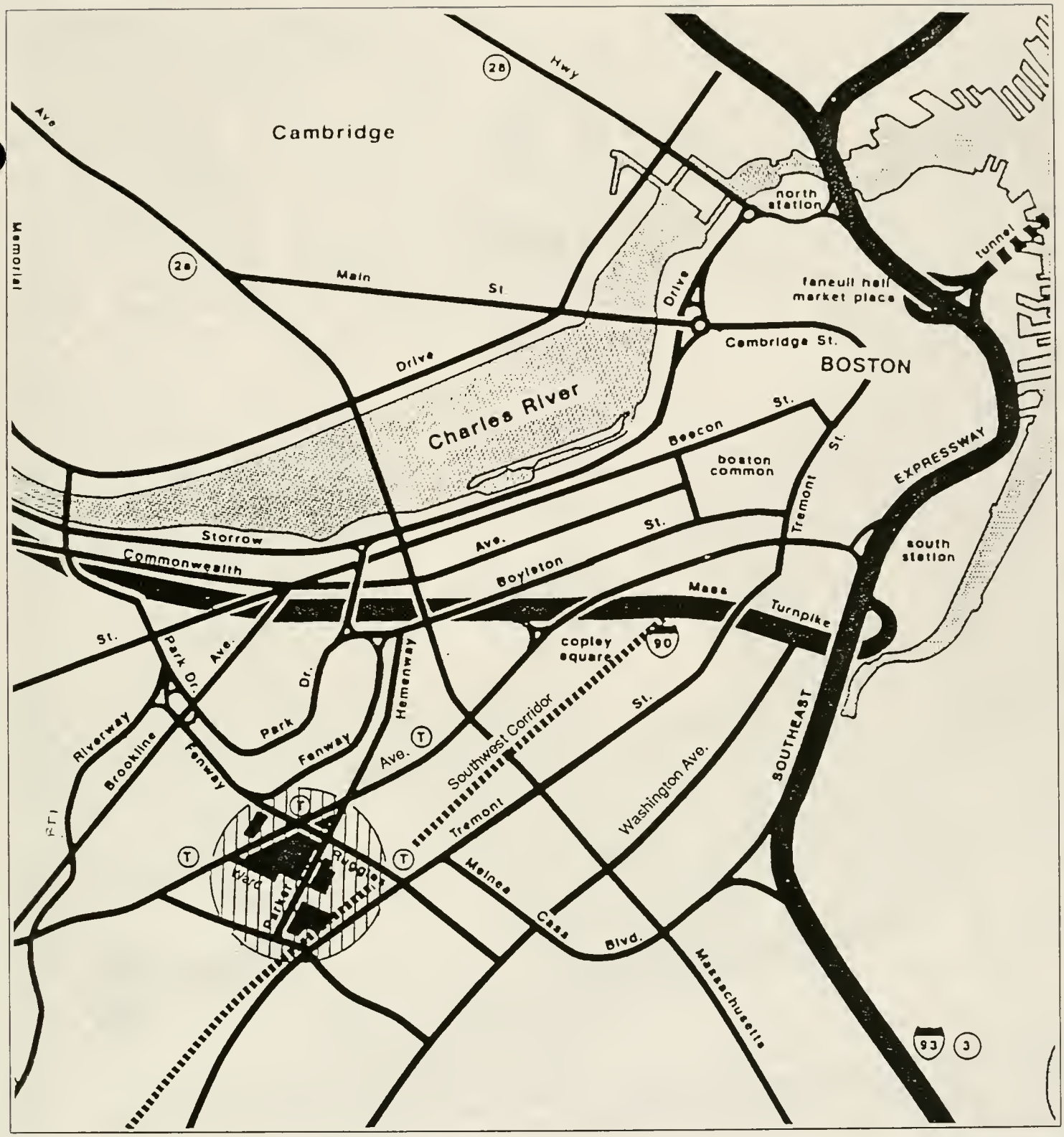
The Boston Campus of Wentworth Institute of Technology is located in a unique geographic location at the confluence of the Fenway, Mission Hill and Roxbury neighborhoods. The general campus boundaries are the Evans Way entrance to the Back Bay Fens to the north, Annunciation Drive on the south, Station Street on the west, and Parker Street and Huntington Avenue on the east. *Figure 3* illustrates the regional location of Wentworth Institute.

2. Campus Community Context/Adjacent Land Use

Existing Conditions

Wentworth's campus is bordered by a variety of urban land uses. It is located in an area of Boston that has residential neighborhoods and many institutions, including those in the Longwood Medical Area, several educational institutions, and museums. Following is a description of the land uses adjacent to the campus as illustrated in *Figure 4*.

Residential - Residential development occupies a substantial area around the campus. To the southwest across Ward Street is the Mission Hill Main public housing development and to the southeast is Alice Hayward Taylor Apartments. These developments share common borders with Wentworth along public streets. A number of private apartments are located along Huntington Avenue in the vicinity of the Institute. There are several nearby student housing facilities associated with the neighboring institutions. The newly renovated Massachusetts College of Art student housing building is across St. Alphonsus Street from Baker Hall, a Wentworth residential facility. Northeastern's West Apartments, is located east of the Institute's campus between Field and Leon Streets. Rubenstein Hall and Museum Villa, both Northeastern residence halls, are adjacent to Wentworth property along Huntington Avenue.



Wentworth Institute of Technology
Boston Campus Master Plan

Regional Location
Figure 3

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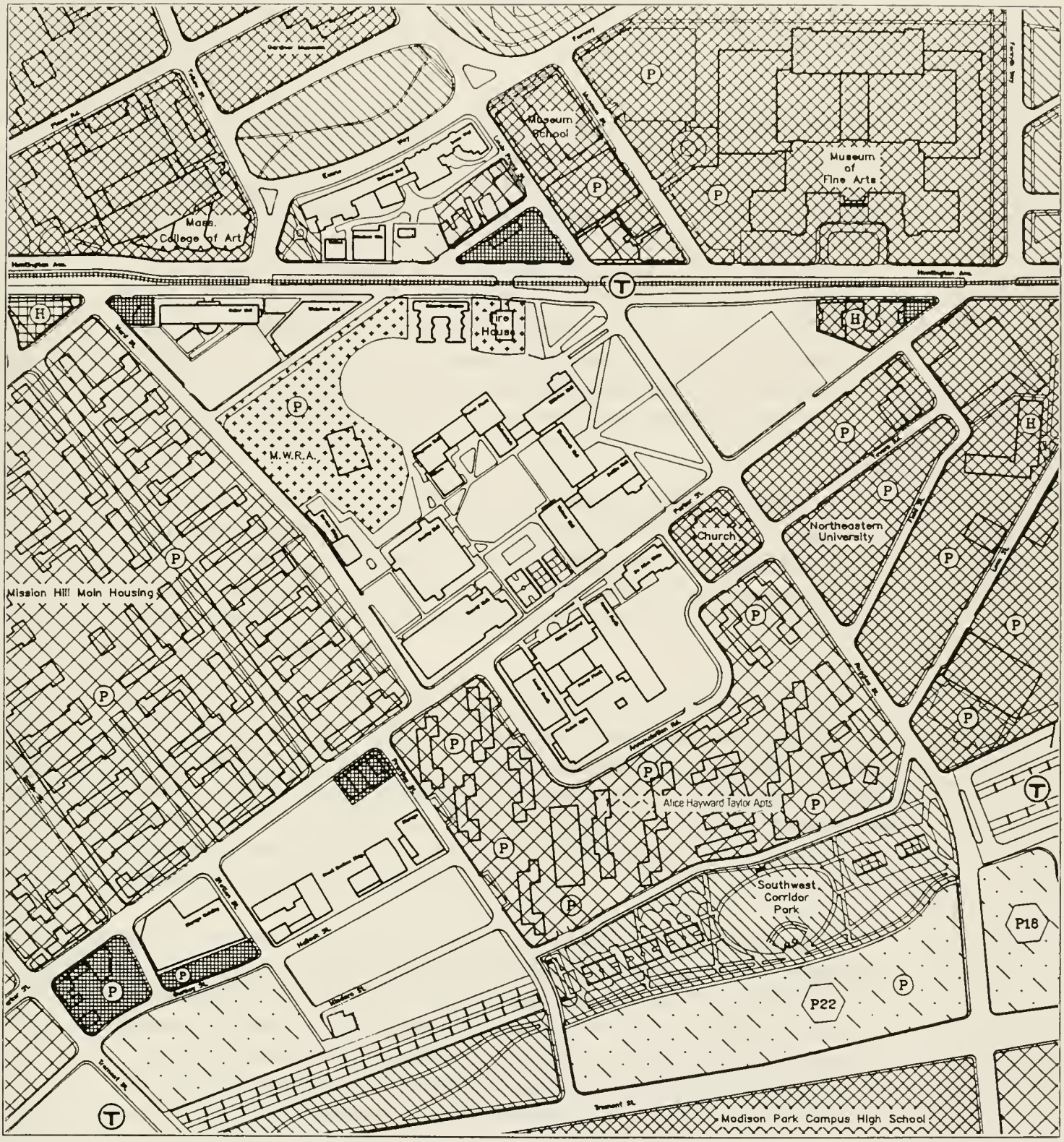

Wentworth Institute of Technology
Boston Campus Master Plan

Adjacent Land Use
Figure 4

0 100 200 400

Commercial	Public Services	Student Housing
Institutional	Public Open Space	Redevelopment Parcel
Residential	Vacant	Parking
		MBTA Stop / Station

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April. 1991

Institutional - The campus is located in a area of Boston that is home for many institutions. As a result, a large amount of institutional land use borders the campus. The Massachusetts College of Art, the School of the Museum of Fine Arts, the Museum of Fine Arts and the Gardner Museum are north of the campus. These institutions have been a stable land use. While they will be renovating and developing new programs, these institutions are not expected to significantly change in the foreseeable future. Northeastern University is east of Wentworth along Huntington Avenue and Ruggles Street. The Northeastern University surface parking lots across Ruggles Street from Wentworth may transition to other campus facilities over time, given that this area represents the remaining land base for Northeastern University. Information provided by the BRA indicates this area may, in the long term, support additional parking, academic and student housing uses.

Commercial - There is very little commercial land use adjacent to the Wentworth campus. A few automobile service stations along Huntington Avenue and a small neighborhood commercial area on Parker Street comprise the commercial uses. However, many commercial activities are located along Huntington Avenue within walking distance of the campus and range from restaurants and shops to convenience stores and professional offices.

Public Service - The land used for public service adjacent to campus is limited to the M.W.R.A. headhouse on Ward Street and the District 5 Firehouse on Huntington Avenue. Both these sites are bordered by Wentworth property. Ruggles Street Station, southeast of campus, is a major multi-modal transportation facility providing convenient access to campus via commuter rail, the MBTA Orange Line and fourteen bus lines that pass through the station. The MBTA Green Line has a stop at the intersection of Huntington Avenue and Ruggles Street.

Public Open Space - The Back Bay Fens open space to the north provides a major regional open space within easy walking distance of the campus. Some of Wentworth's student housing is located on Evan's Way, a gateway to the Fens. To the south of the campus is the Southwest Corridor Park which provides tennis and basketball courts, bikeways and walkways and limited green open space. The Southwest Corridor Park is part of a linear open space system that runs from Roxbury Crossing to the Back Bay Station along the southwest transportation corridor.

Vacant Land - Redevelopment parcels, created in part by the southwest corridor transportation project, comprise the majority of the vacant land in the vicinity of the campus. These sites represent the most significant potential for change in land use pattern near the Wentworth campus. Parcel 18, directly adjacent to Ruggles Street Station, is planned to be a major mixed use (office, commercial, hotel) development, the majority of which is to be office. Development of this site will cause significant increase in area wide vehicle trips and daytime working population. Parcel 22, a redevelopment

site south of the Southwest Corridor Park along Tremont Street, initially intended to be a housing project, has recently been announced by the City as the site for a new police station facility. The program for this facility includes a significant on-site employee staff and potentially police vehicle storage and servicing operations.

Five-Year Plan

Land uses immediately adjacent to the campus are likely to remain fairly static over the planning period. In the larger campus vicinity, however, Parcel 18 and Parcel 22 are sites that are likely to be at least partially developed within five years. This will not necessarily have a direct influence on Wentworth but may have secondary influences through potential increases in background traffic, which is dependent on the widening of Ruggles Street. Of areawide concern is the proposed new Police Station on Parcel 22. In addition to an operations center, for centralized vehicle maintenance for Police vehicles is proposed. This operation may present significant traffic, noise and visual concerns especially adjacent to the southwest corridor parkland.

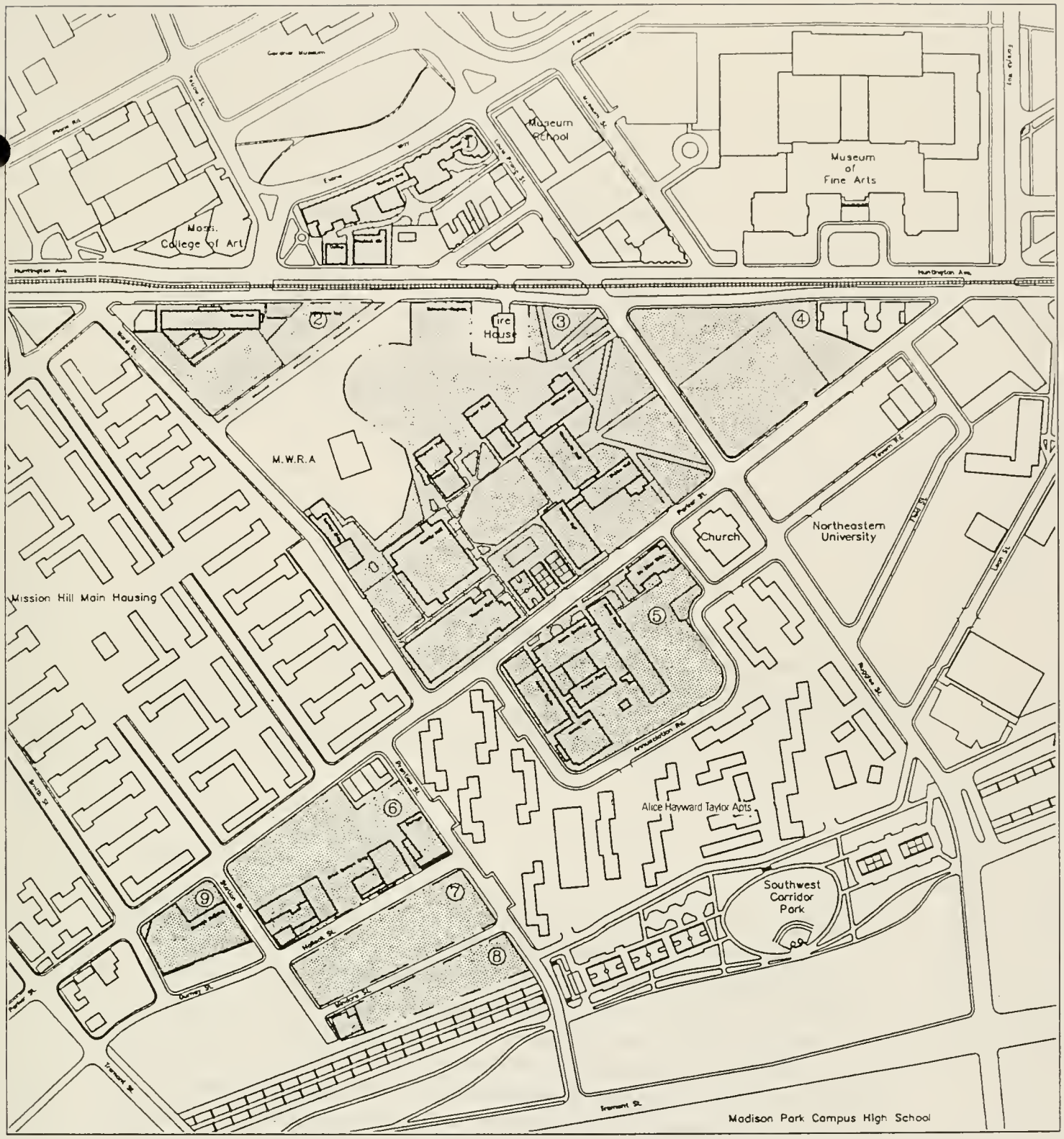
3. *Ownership*

Existing Conditions

The Boston Campus of Wentworth Institute covers a total of 29.5 acres of land. *Figure 5* illustrates the location and pattern of Wentworth's land holdings. Wentworth's land ownership pattern is fairly contiguous around the academic core with the Annex building complex and Triangle parcel. However, other than this academic core, the property owned by the Institute is disjointed. Several different historical and market factors contributed to defining this pattern.

The campus is divided by Huntington Avenue which has the MBTA Green Line in a median making connections between the campus land on either side of Huntington Avenue constrained and limited. MWRA-owned land separates the campus academic core from Baker Hall and Mickelson Hall. The campus academic core is separated from the Triangle parcel and the Annex complex by Parker and Ruggles Streets, streets that carry large amounts of traffic between the campus properties, but are relatively narrow.

The Wentworth Boston Campus property has been divided into nine parcels. The following table records the size of each of the parcels. *Figure 5* identifies the location of each parcel shown below.



Wentworth Institute of Technology
Boston Campus Master Plan

Ownership
Figure 5

0 100 200 400

Wentworth Property (29.5 Total Achres)

① Parcel Key

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April, 1991

Table 1. Boston Campus Acreage

Parcel 1	1.9 Acres
Parcel 2	2.2 Acres
Parcel 3	12.2 Acres
Parcel 4	3.0 Acres
Parcel 5	4.0 Acres
Parcel 6	2.8 Acres
Parcel 7	1.6 Acres
Parcel 8	1.0 Acres
Parcel 9	.8 Acres
Total	29.5 Acres

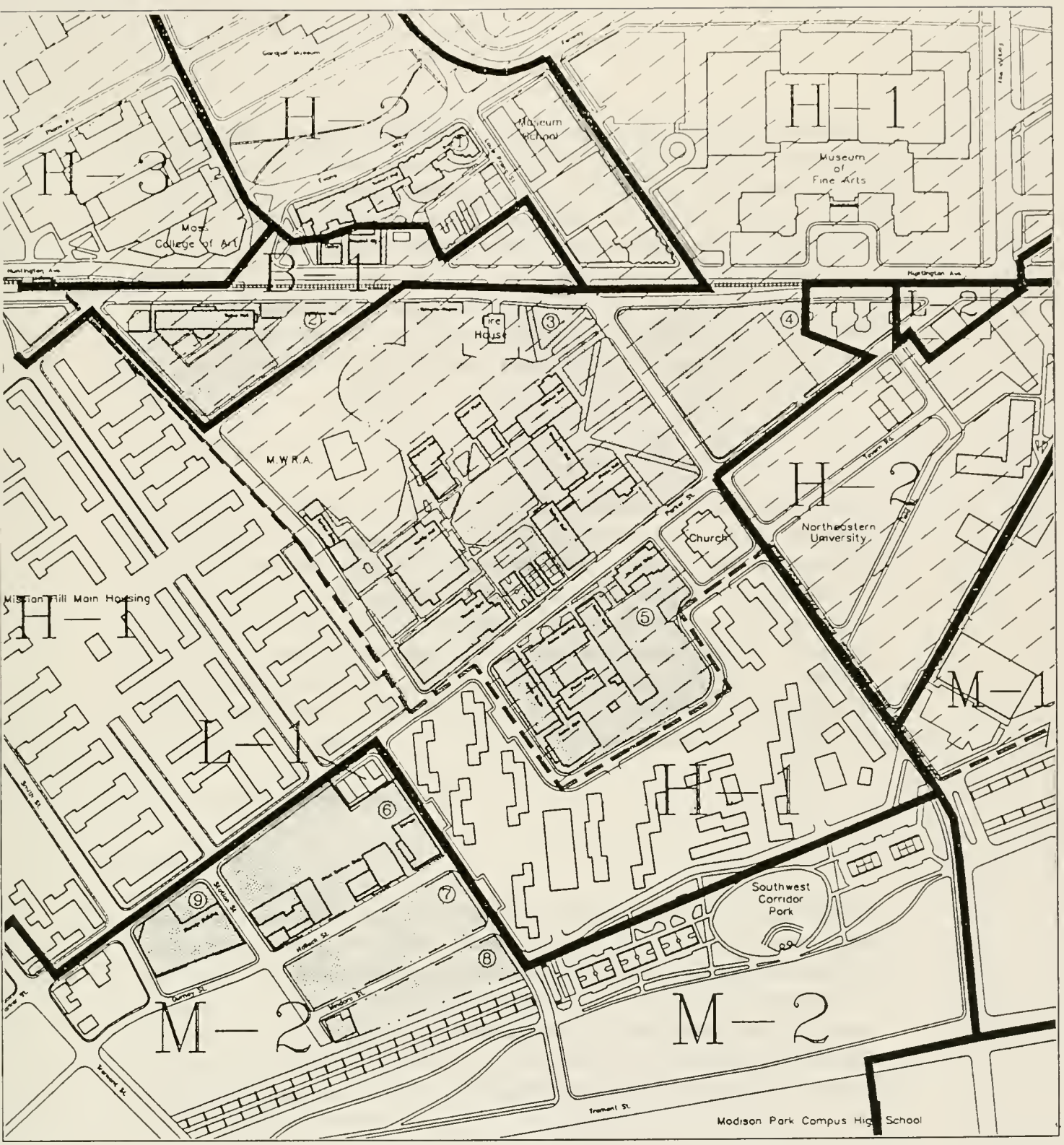
Five-Year Plan

The Five-Year Plan does not specifically propose property acquisitions except for Mindoro Street and Halleck Street through the decommissioning process, and the completion of the acquisition of the now-defunct gas station at the northwest corner of Vancouver and Huntington. The basic premise of the plan is to focus on consolidation within existing blocks where Wentworth owns property and has active uses.

3. *Zoning*

Existing Conditions

The campus generally shares borders with the Fenway and Roxbury neighborhoods, but lies predominantly within the Mission Hill neighborhood. As part of a city wide rezoning initiative, the Mission Hill Interim Planning Overlay District (IPOD) was created to update the base zoning in the neighborhood. Most of Wentworth's property is in this IPOD. A community advisory committee, the Mission Hill Planning and Zoning Advisory Committee (PZAC), was formed by the City to implement the IPOD and to recommend permanent zoning regulations with staff assistance from the Boston Redevelopment Authority (BRA) and the Mayor's Office of Neighborhood Services (MONS). The Mission Hill PZAC has not, to date, formally recommended any interim development regulations that vary from existing base zoning. As a result, the PZAC's role has focused on project review, rather than proposing new development standards and regulations.



Wentworth Institute of Technology
Boston Campus Master Plan

Zoning
Figure 6

0 100 200 400

Zoning District Boundary
Institutional Overlay District
Wentworth Property

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The Zoning Map, *Figure 6*, illustrates the zoning districts of the campus and adjacent areas, and the Institutional Overlay District. Current base zoning districts located on the campus property include H-1 (Apartments - 1.0 FAR limit), H-2 (Apartments - 2.0 FAR limit), B-1 (Retail Business and Offices - 1.0 FAR limit) and M-2 (Light Manufacturing - 2.0 FAR limit). Such zoning categories do not specify that institutional uses are allowed as-of-right and have required Special Use Permit procedures for new institutional construction projects and major renovations. Base zoning on land adjacent to campus includes H-3 (Apartments - 3.0 FAR limit), M-1 (Light Manufacturing - 1.0 FAR limit), M-2 (Light Manufacturing - 2.0 FAR limit), and L-1 (Local Retail and Service - 1.0 FAR limit)

Five-Year Plan

Zoning for the campus property is likely to remain the same for the foreseeable future. That includes the requirement that institutional development projects are only allowed by Special Permit. However, it is the intention of the Institute that the approval of the Five-Year Plan by the BRA will enable the Institute to submit individual projects for processing towards obtaining building permits. Given the mix of zoning categories which are not necessarily reflective of institutional development patterns, the varying site development regulations and the fact that many of the Institute-owned buildings were built many years ago, it is anticipated that some projects may require zoning relief in the form of variances. These may include setback, FAR and parking requirements.

4. Campus Land and Building Use

Existing Conditions

The land and building uses on campus include a traditional range of uses and activities totalling approximately 720,000 nsf. Given the campus land area of 29.5 acres, overall the campus is developed at an FAR of .56. The primary group of these are academic, administrative, and student service uses which form the core campus. The core is composed of several mixed-use buildings. Most of the other campus uses follow the "traditional" model with student housing, parking and service functions located on or near the campus perimeter. Building and land uses are illustrated on *Figure 7* and described by category below.

Student Services/Center - Most of the student service activities, an important function on the campus, are concentrated in two buildings. The first, Beatty Hall, is a prominent building in the core of the campus which houses the library, cafeteria, computer center, bookstore and classrooms. The second, the Student Center, is located on the north side of Huntington Avenue, and houses general student activity space and lounge space. This facility is not on a heavily traveled path for most of the students, especially commuter students, and crossing Huntington Avenue creates access constraints. Other

buildings containing student services programs are Collins Hall, on the north side of Huntington Avenue, which houses the Co-Op Program, and Wentworth Hall, which houses the offices of the Registrar and Bursar.

Academic - The Institute is organized around four academic divisions: College of Design and Construction (CDC), College of Engineering & Technology (CET), College of Arts and Sciences (CAS) and Division of Management Science (DMS). Teaching facilities and faculty offices are generally located within buildings in the academic core. CDC (in the Annex) is currently the only division that is reasonably well consolidated within a single facility. However, as noted in the Program section of this document, substantial renovations and construction of new space are needed to accredit and maintain competitive programs in the CDC. The library has been found to be significantly short of study space and bound volumes when compared with accepted national standards. However, the Institute has unique library needs insofar as it primarily services technical disciplines, is part of a networked consortium of libraries in the immediate area, and the Institute does not offer graduate degrees (which require space at higher ratios). Nevertheless, the library falls short of the standards by such a large margin (especially in the provision of study space) that some degree of space expansion for the library will be necessary in the future as academic programs evolve and the demand for on-campus library resources increases.

Administrative - Most of Wentworth's administrative space is located in Wentworth, Dobbs and Williston Halls, which all occupy prominent locations within the campus core. Administrative units are currently overcrowded and additional space is necessary to meet contemporary needs. Several functions of the same administrative units take place in separate areas throughout these buildings and as a result, suffer from fragmentation. However, the central core location of Wentworth's administrative offices is generally convenient for students, faculty and staff.

Service/Support - The Physical Plant Department is the primary user in this category. The main service building located behind Beatty Hall on Ward Street provides for Physical Plant Offices and Operations in what was at one time horse stables for the Boston Police Department. Other service/support locations include the Power Plant (Building #1) and the Annex power plant (Building #20). The Power Plant, the first building constructed on campus, is often used as teaching facility (mechanical engineering etc.) and is centrally located to provide power and heat for the campus core. It is also the site of a new cogeneration plant installed in 1989.

Student Housing - Most of the 902 beds of student housing are contained in two general areas to the northwest of the academic core. These include Baker Hall and Rogers and Edwards Hall which are along the south edge of Huntington Avenue, and Evans Way and Tudbury Hall which are to the north across Huntington Avenue and face on Evans Way.

The area containing Tudbury Hall and Evans Way Hall is a desirable student housing precinct. This housing is near the Fens, on the edge of campus well within a five minute walking distance to the academic core and adjacent to private market housing and other student housing (for example Mass College of Art). However, crossing of Huntington Avenue to the core campus is required.

Rogers and Edwards Hall is the most popular student housing on campus, in part because it consists of apartments that allow students to prepare food. However, studies conducted by consultants to Wentworth have determined that this facility is in need of substantial renovation as student housing and may need to be considered for demolition or possibly renovated for another use. *Table 2* breaks down the existing student housing supply by type and amount.

Table 2. Existing Student Housing Supply

Facility	Beds	Type
Baker	280 beds	Traditional double-loaded corridor; all double rooms; all male.
Evans	410 beds	5, 6 and 8 person suites.
Edwards/Rogers	212 beds	2 and 3 person studios; one bedroom apartments.
TOTAL	902 beds	

Student housing demand has dropped significantly over the last two years. In the fall of 1989 there was a waiting list for on-campus housing. By the fall of 1990, approximately 100 on-campus beds remained unoccupied. This general trend is expected to continue for the next couple of years as the number of high school graduates will continue to decline through 1994.

Recreation/Athletics - Tansey Gym is the major athletic/recreation building for the campus and is located next to Beatty Hall at the corner of Parker and Ward Streets. The Annex Gym, a smaller facility, has a basketball court limited to evening use to minimize disturbance to the classrooms below.

Outdoor recreation space is very limited and includes two tennis courts, a basketball court and a sand volleyball court located between Tansey Gym and Watson Hall. Other off-campus public field space, as available from Madison Park High School and other schools, is used by the Institute for intramural and varsity sports practice and competition. Additional Institute-controlled field space is necessary to provide adequately for intramurals, intercollegiate competition and informal play.

Open Space - There are two major open spaces within the campus. The first is the broad landscaped lawn area that sets back Wentworth Hall from Ruggles Street and acts as the ceremonial "front door" for the campus. The other is the internal quadrangle formed by Beatty Hall, Wentworth Hall and the other core campus buildings. These two important open spaces are not physically connected because Buildings # 1-5 form a solid building wall between these two spaces.

The balance of open space serving the campus is created by the public street corridors in and around the campus.

Parking - There are 9.1 acres of campus property used as surface parking lots, accommodating 1,028 parking spaces. 768 parking spaces are used by Wentworth and cover some 6.6 acres. The balance of on-campus parking areas are leased to MASCO (260 spaces). Most of the parking supply is generally located at the perimeter of the campus. However, some of the parking lots are located in areas that can be considered within the campus core such as East Lot, West Lot and possibly Baker Lot. Currently, the Parker Street Lot (131 spaces) is closed because the Triangle Lot became available to Wentworth in the winter of 1990 as the lease with Children's Hospital expired. However, the Parker Street Lot had been actively used by the Institute prior to 1991.

Facilities Leased To Others - Wentworth leases 84,219 gsf of building space to Northeastern University for general storage. The land area in the blocks defined by Prentiss Street, Halleck Street, Station Street and the Southwest Corridor (2.5 AC) are currently leased to MASCO for parking.

Vacant Land - Two significant vacant areas exist on campus; that portion of the Triangle parcel along Huntington Avenue that is not actively used (for parking); and, the Parker Street lot which is currently closed to parking.

Museum School

Museum of Fine Arts

Mass. College of Art

Fire House

M.W.R.A.

Church

Northeastern University

Mission Hill Main Housing

Alice Hayward Taylor Apts

(closed)

Southwest Corridor Park

Madison Park Campus High School

Wentworth Institute of Technology

Boston Campus Master Plan

Existing Campus Land Use / Building Use
Figure 7

0 100 200 400

Student Services Center
Academic
Administrative
Services / Support
Student Housing
Recreation / Athletics
Open Space
Parking
Vacant
Leased to Others

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Five-Year Plan

Only the CDC Renovation and Addition project and the renovations to Ira Allen and Beatty Hall propose the new construction or renovation of buildings. Other physical improvements to the campus contained in the Five-Year Plan are limited to site improvements for pedestrian and vehicular circulation and campus beautification.

Phase 1A of the CDC renovation is limited to 16,165 sf of renovation. Phase 1B will include 8,754 sf of renovation and 72,972 sf of new construction. Thus, at the end of the proposed Five-Year Plan, the overall campus will be developed at an FAR of .62 as compared to the existing FAR of .56. This increase represents 10 percent of the existing building area on campus and is insignificant from the perspective of perceived development density. Furthermore, it maintains the overall campus development well within that allowed by the accumulated FAR included within the zoning categories across the campus as a whole.

Within the five-year planning horizon, the same overall pattern of land and building use will remain with the exception of introducing field space on the Triangle site. The renovation and addition to the CDC will increase the available academic-related square footage generally available on-campus and increase scheduling flexibility for classrooms, seminar rooms, etc. In the longer term the renovated CDC and renovated Ira Allen building will also allow for space shifts within other academic/administrative units to consolidate departments into the same building and allow Wentworth Hall to provide for the "public" functions and expanded academic and administrative areas.

On-campus student housing numbers will remain the same as today at 902 total beds. With existing vacant beds in the inventory and Massachusetts high school demographics trending downward through 1994, no immediate need for new beds can be substantiated. However, in order to maintain enrollment levels it may prove to be necessary for the Institute to obtain a higher proportion of students from a wider geographic area who would desire on-campus housing at a significantly higher rate than the existing student body profile. The Institute will carefully monitor these trends on an annual basis to determine if additional student housing becomes warranted.

Should the Edwards/Rogers Hall be determined to be unsuitable for renovation to continue as student housing, a student residence facility to replace those beds (212) would be necessary. However, this would likely take place after the five-year time horizon as recent investments have been made to the roof and exterior of Edwards/Rogers Hall.

Shifts in the location of the existing parking supply are anticipated in the Five-Year Plan. To maintain the balance of the number of spaces on campus, the Parker Street lot will have to be reopened with the displacement by fieldspace of most of the parking on the Triangle site. These parking shifts are more fully documented in the Transportation and Parking Management and Mitigation Plan section of this document.

D. CAMPUS DEVELOPMENT AND URBAN DESIGN

This section describes the Five-Year Plan initiatives for the campus in relation to its historical pattern of building, its spatial structure and character, and its urban design context.

1. Historical Development

Following is a simplified discussion of the development of the campus from its origins in 1904 through the 1990's. The analysis highlights those aspects of planning and design that were significant in shaping the physical environment of the campus. Each period of growth is indicated by an accompanying illustration, *Figures 8 through 12.*

Development Origins Through 1916, Figure 8

Wentworth Institute was founded in 1904. Its first campus facilities were developed on recently-filled lands in Boston's Back Bay, over the former stream course of the Stony Brook. Throughout the period from the completion of the Back Bay Fens (ca. 1894) to the 1910's, this area was the location of choice for many prominent Boston institutions, including the Museum of Fine Arts, the Boston Medical Library, Forsyth Dental Infirmary, Simmons College, and numerous medical institutions near the Harvard Medical School on Avenue Louis Pasteur. Wentworth Institute occupied a prominent site at the confluence of the recently created Huntington Avenue extension and the older Parker Street thoroughfare.

The exact positioning of the first building complex affirmed the prominence of the site by orienting to Ruggles and Parker Streets, without sacrificing a notable Huntington Avenue address. The resulting open triangle of land opposite the Museum of Fine Arts was treated with a decorative fence and gates so as to extend the implied axis directly to Huntington Avenue. Wentworth-owned lands to the south and west of the original buildings remained unimproved at this time.

Original plans of the design for Wentworth, Williston, and Dobbs Halls, by noted Boston architects Peabody and Stearns, indicate that a significant arrival court and landscape zone was envisioned at the Ruggles Street entrance to the complex. This design featured elaborate paved areas, gates and fences in a level of detail commensurate with that of the buildings themselves. Such a focus on the "front door" of

the complex is indicative of the importance placed by the designers and the Institute on an image to be projected on Huntington Avenue to neighboring institutions, potential students, and the general public. However, very little of the landscape envisioned at that time was ever implemented, and photographs of later periods show that even tree plantings did not occur with any significance until the 1960's.

Peabody and Stearns Master Plan, ca. 1920, Figure 9

Subsequent to completion of Dobbs hall in 1916, a master plan for expansion of the Institute was prepared by the original architectural consultants. That plan, which proposed extending the bilateral symmetry and introduced a series of modular extensions surrounding courtyards, bears a striking resemblance to the plan prepared by William Welles Bosworth, Architect, for the Massachusetts Institute of Technology, around 1913. Although Wentworth did not carry out the Peabody and Stearns plan precisely, several aspects of the plan are worth noting:

1. Expansion of facilities into the "triangle site" with a proposed Auditorium and Preparatory Academy, and sufficient open space to retain views from Huntington Avenue to Wentworth Hall.
2. Primary internal focus on a quadrangle, with a cross-axis extending towards a secondary arrival court on Parker Street.
3. Narrow laboratory or workshop buildings which defined minor courtyards, with connecting corridors throughout, in a fashion directly patterned after the MIT model.

Development Through 1927, Figure 10

Construction of Watson Hall in 1927 held to the basic tenets of the Peabody and Stearns plan, although it occupied the proposed cross-axis along Parker and did not give strong definition to the proposed quadrangle as such. Architecturally, the building conformed to the existing context in its bulk and height, in the use of light colored brick and classical limestone trim, and in its tripartite organization of a high stone base, brick middle, and renaissance-style attic and roof story. While these parameters derived from the original buildings, Watson Hall was sufficiently divergent in its particular style and detail to have its own identity.

During this period, lands surrounding the Institute were further improved to accommodate expansion, and the Institute's first athletic fields were laid out to the southwest of the building complex, approximately where Beatty Hall exists today. Aside from the use of the Institute grounds for housing and training troops during the war effort in the 1940's, little development took place between the late 1920's and the mid-1960's.

Proposed Expansion Plan, 1967, Figure 11

During the 1960's, considerable planning efforts were undertaken by Wentworth for expansion of the Boston campus. Two expansion planning reports were prepared by Andrew Canzanelli, a planning consultant to the Institute. The planning efforts during this period reflected a potential growth horizon at that time to 3000 students, and proposed strategies for the accommodation of that population in construction of new facilities and rehabilitation of older structures as required. Following is a summary of the influences on the planning efforts and the specific proposals that were set forth.

1. By the late 1960's, the Institute still served primarily commuting students, but envisioned housing an increasing number of the incoming population. To satisfy this demand, a dormitory complex of 950 beds (ten stories) was proposed for the present Baker Hall site; ultimately less than one-half of this program was built on this site.
2. Parking for the large commuting population was becoming a problem. The 1968 plan proposed construction of a parking structure to house 375 vehicles on WIT holdings at Station and Parker Streets.
3. Beatty Hall had been completed as a multi-purpose facility, giving rise to the more complete definition of the quadrangle as the primary open space and focus of the campus. Plans for the new gymnasium were also intended to provide further enclosure for the quad and to provide a drop-off area on the quad from Parker Street, an idea carried forward from the 1920 master plan. Also, the proposed site for the gymnasium would provide modest room for athletic fields behind the gym, adjacent to Ward Street.
4. The serious threat surrounding the proposed Inner-Belt Highway System, which was to pass in an open cut channel in the alignment of Ruggles Street, had direct influence on planning during this period. Faced with losing the entire triangle site to access roads and the submerged highway, Wentworth actively pursued land acquisitions to the south and west, as well as across Huntington Avenue. This spate of acquisitions resulted in additional housing facilities in the Evans Way area, classroom and office space directly on Huntington Avenue in Mickelson and Collins, and an increase in the control of lands in the area along Parker Street, southwest of the campus.
5. While the newly acquired holdings were somewhat disjointed, they represented some potential for new building sites to accommodate the anticipated growth. The 1968 planning report emphasized two other strategies related to this point that are worth noting. First, the plan contained a motivation to achieve a greater presence for the Institute along Huntington Avenue, specifically at the sites of Edwards-Rogers Hall, the WIT-owned southwest corner of Ruggles and Huntington, and including the site of the District 5 Fire Station, which the plan recommended for acquisition. Second, the plan expressed frustration with a recent land taking near Ward Street by the Metropolitan District Commission, and complained of the

"unsatisfactory and illogical" nature of that property boundary in general. The 1968 plan recommended simplification of the Wentworth/MDC (now MWRA) property line and an exchange of land with the MDC that would enhance the setting of the Institute.

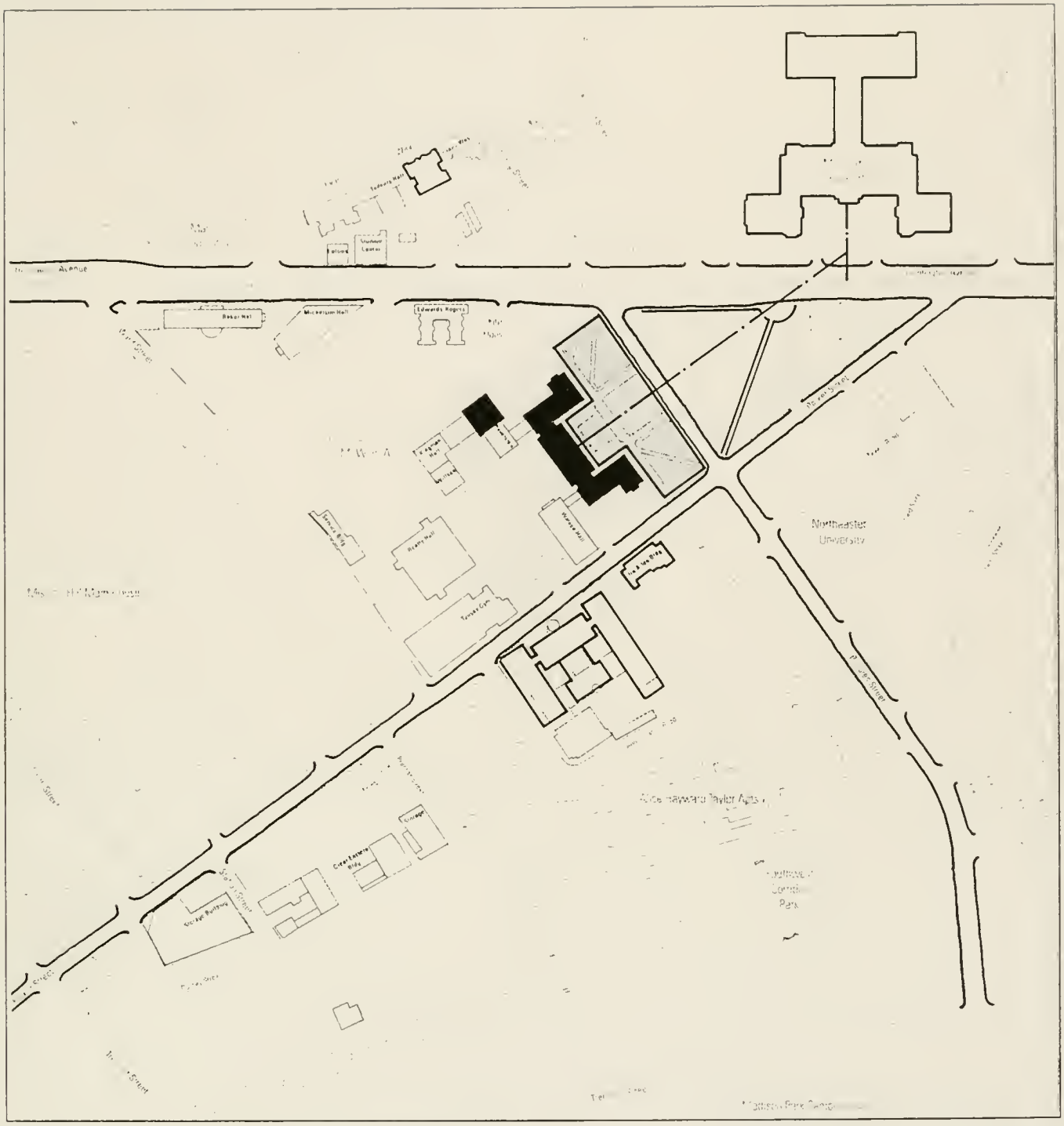
Facilities Planning in the 1980's, Figure 12

During the 1980's, physical planning for the Institute resulted in several changes. Additional acquisitions were made in the area of the southwest parcels, resulting in significant ownership along Parker Street and adjacent to the recently completed Southwest Corridor Park. Acquisition of the former Boston Trade School provided opportunities for expansion of several degree programs in the Annex. Additionally, capacity for student housing in the Evans Way area was significantly increased and the quality of existing housing improved.

In 1986, the Physical Plant Department undertook a planning study to set goals and priorities for the immediate and long-term future of the Boston campus. While it was not specifically driven by an academic program plan, the *Preliminary Facilities Development Plan* addressed significant physical planning issues and analyzed a wide range of development scenarios. The plan recognized the need for a comprehensive solution to the problem of accommodating parking for the predominantly commuting population of the Institute. Alternative studies in the plan struggled to diminish the impacts of parking on campus open space and pedestrian pathways. Additionally, the plan recognized the historically important objective of retaining identity for Wentworth on Huntington Avenue and pointed out the need for an improved visitor arrival sequence that relates to the "front door" of the Institute.

While no single recommended expansion plan emerged from the 1986 study, a subsequent effort by the Physical Plant Department produced a working plan to guide renovations, expansion, and acquisitions, called the *10-Year Facilities Development Plan*. This plan contained the following components:

1. Expansion and renovation of the Annex.
2. Accommodation of parking and athletic facilities on the consolidated southwest parcels bounded by Parker and Prentiss Streets.
3. Expansion of student housing.
4. Retention of the Triangle site on Huntington Avenue as a potential development site for non-Institute uses



Wentworth Institute of Technology
Boston Campus Master Plan

Development: Origins Through 1916
Figure 8

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Existing Wentworth Buildings
Existing Non-Wentworth Buildings

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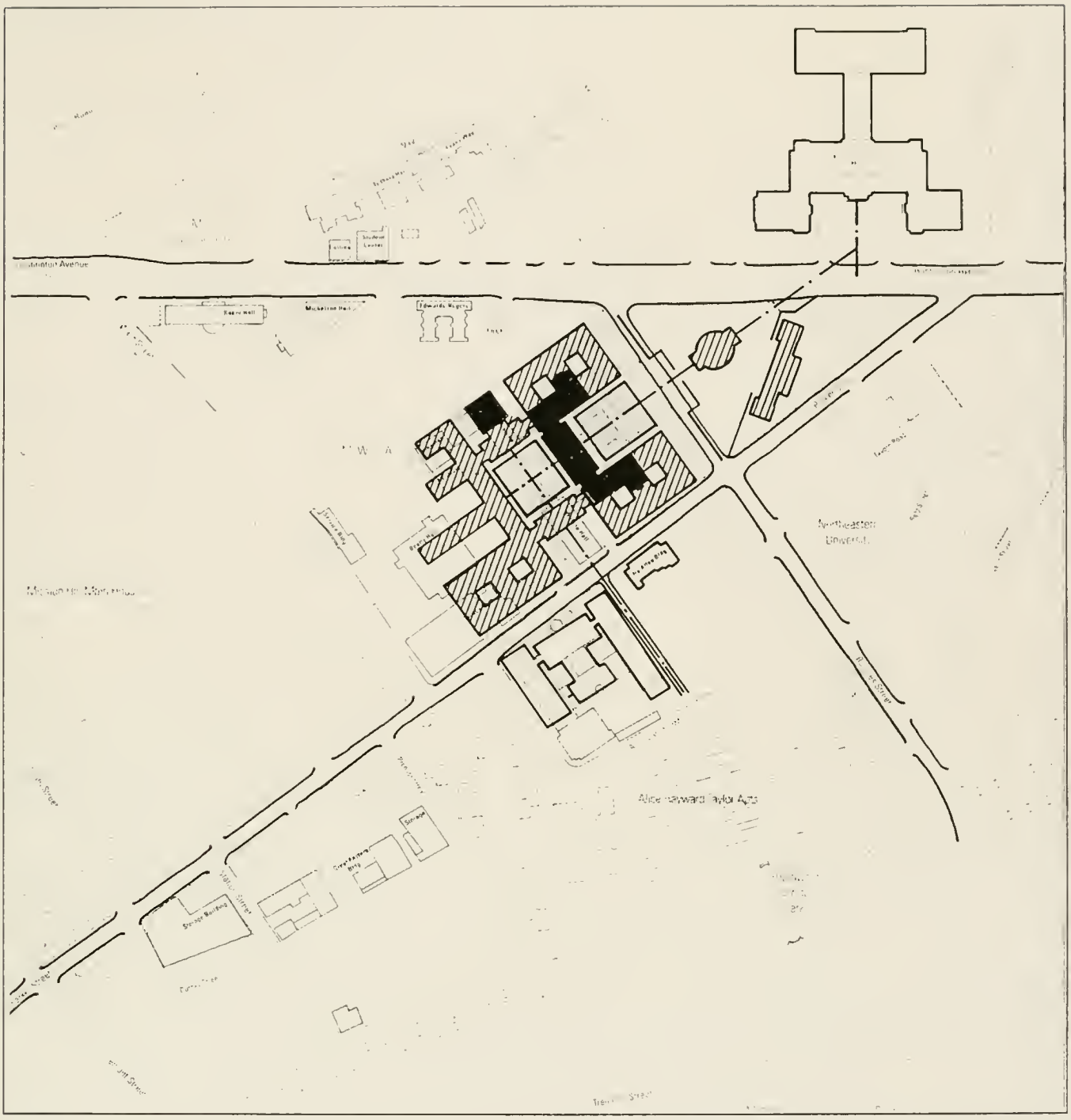

Wentworth Institute of Technology
Boston Campus Master Plan

Peabody and Stearns Master Plan ca. 1920
Figure 9

0 100 200 400

Existing Wentworth Buildings
Existing Non-Wentworth Buildings
Proposed Wentworth Buildings

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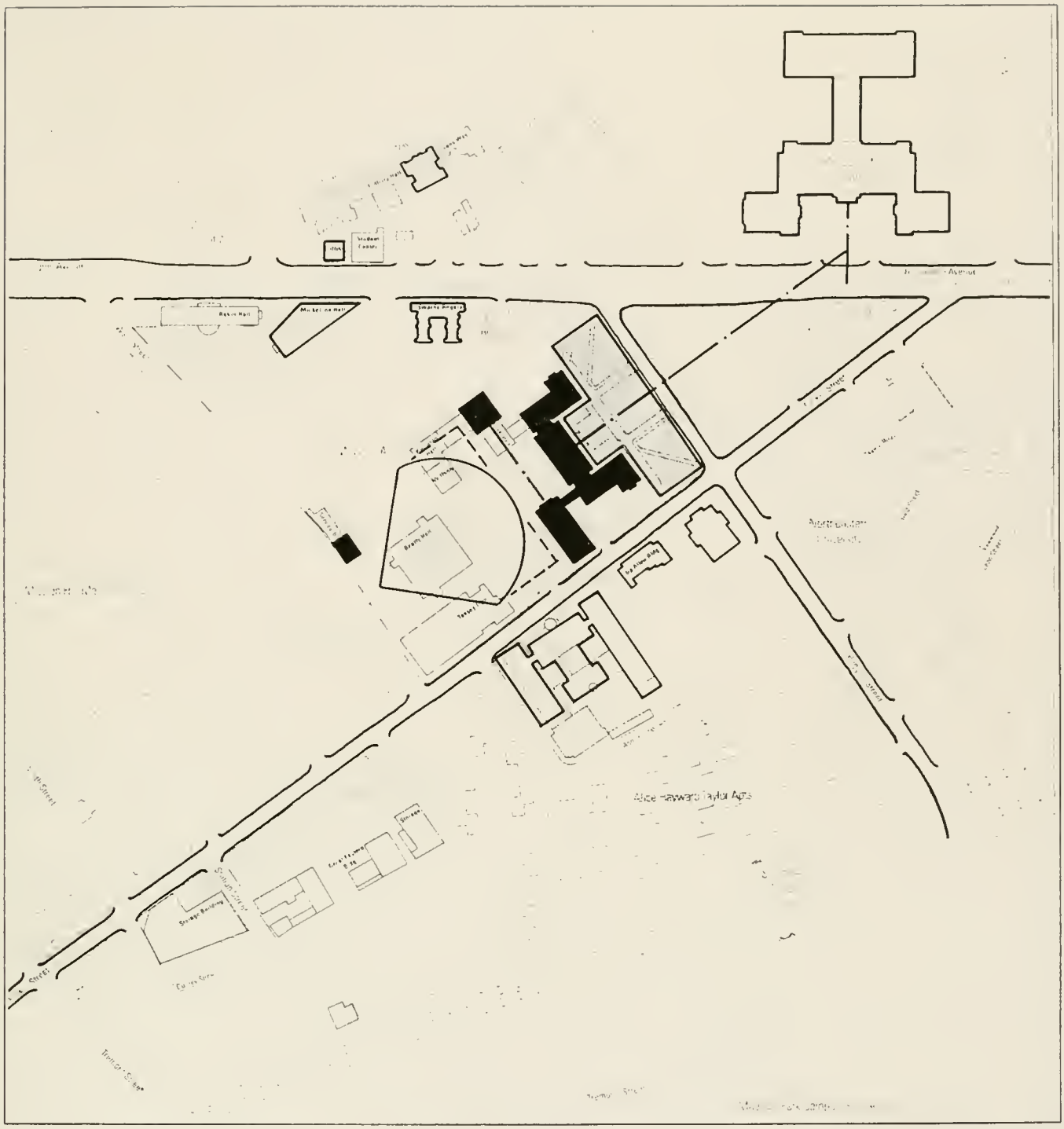

Wentworth Institute of Technology
Boston Campus Master Plan

Development Through 1927
Figure 10

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Existing Wentworth Buildings
Existing Non-Wentworth Buildings

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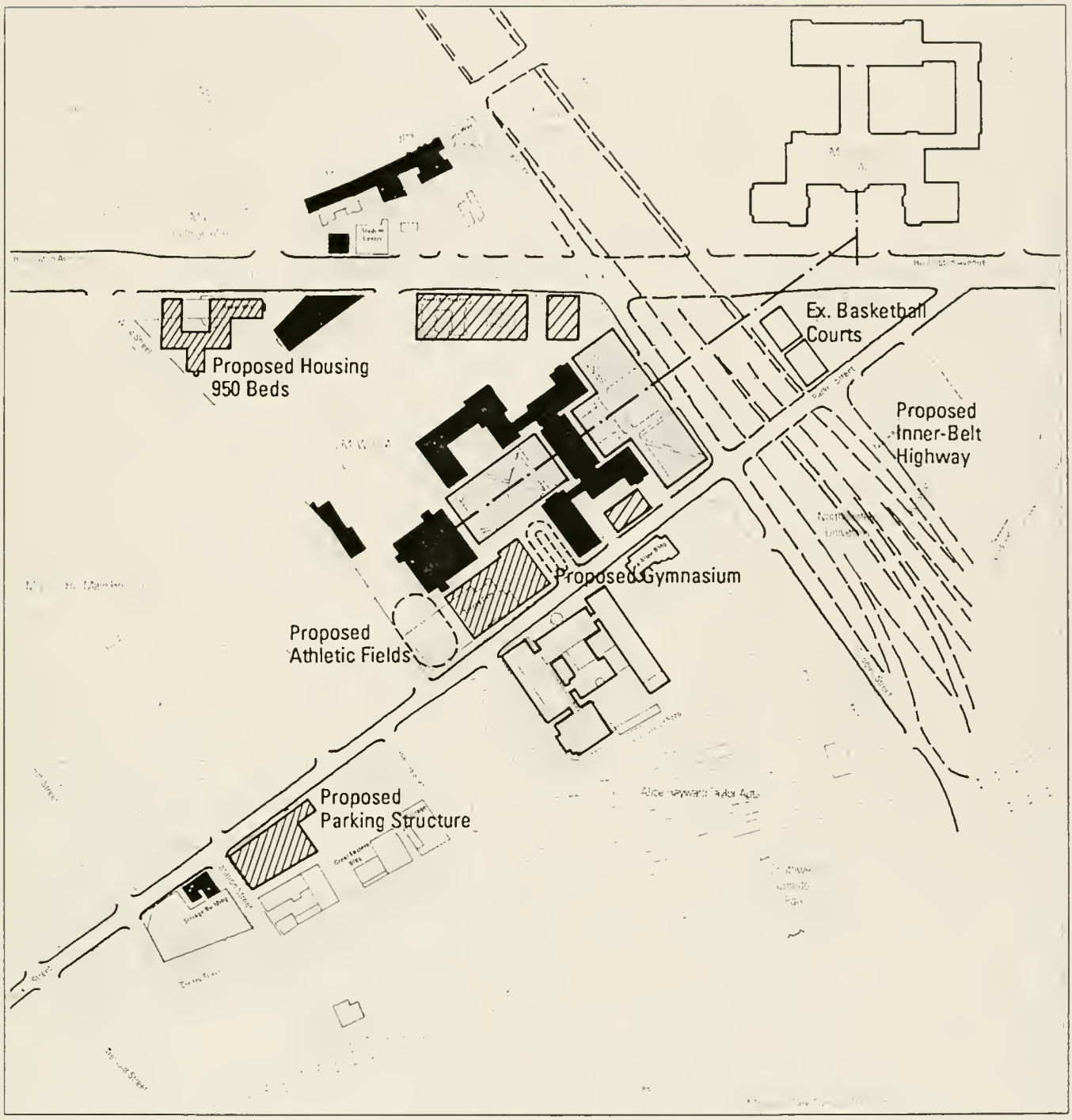

Wentworth Institute of Technology
Boston Campus Master Plan

Proposed Expansion Plan 1967
Figure 11

0 100 200 400

Existing Wentworth Buildings
Existing Non-Wentworth Buildings
Proposed Wentworth Buildings
Potential Wentworth Building Sites

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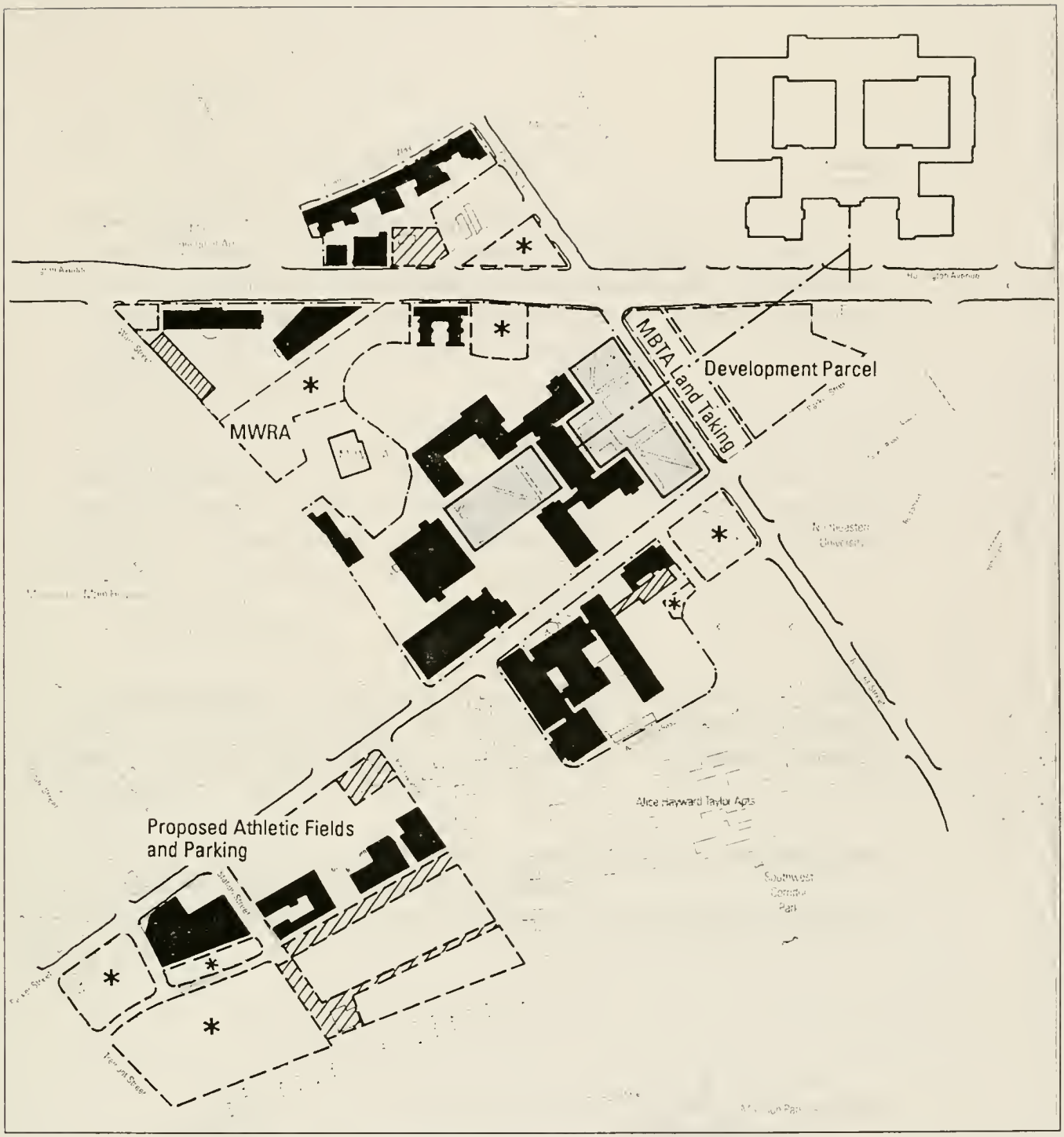

Wentworth Institute of Technology
Boston Campus Master Plan

10-Year Facilities Development Plan 1989
Figure 12

0 100 200 400

Existing Wentworth Buildings
Existing Non-Wentworth Buildings
Proposed Wentworth Buildings
Potential Wentworth Building Sites
Acquisitions
Acquisitions if Available

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2. *Campus Design*

Campus Structure and Character

Campus structure refers to the overall arrangement of buildings and open spaces. A coherent and orderly structure serves to make a campus easy to navigate, and can provide an institution with a clear and memorable physical identity. Each proposed improvement in the Five-Year Plan attempts to contribute to the overall clarity of the campus, and seeks to improve the visual character and enhance the image of Wentworth within its surrounding context.

To simplify this discussion, the existing Wentworth Boston campus can be described as a series of precincts with specific spatial and use characteristics. These precincts are as follows: A) Main Academic Area; B) Annex Area; C) Baker Hall/Mickelson Hall Area; D) Evans Way/Huntington Area; and E) Southwest WIT Parcels. The precincts are identified on the map of Spatial Structure and Precincts, *Figure 13*

A. Main Academic Area

Wentworth's primary academic and administrative environment consists of a series of clustered, connected or closely proximate buildings of predominantly "institutional" character. The configuration of these buildings gives rise to two primary campus spaces of significance:

a. A prominent front door space defined by Wentworth Hall and its flanking wings, facing Ruggles Street and Huntington Avenue; and
b. An internally-oriented quadrangle which represents the principal focus of campus activity.

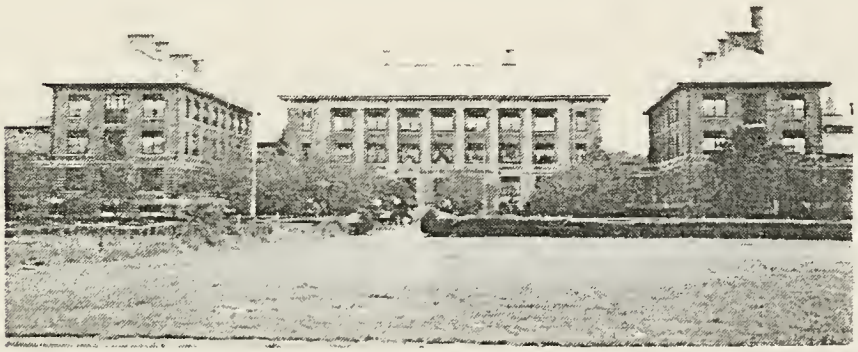
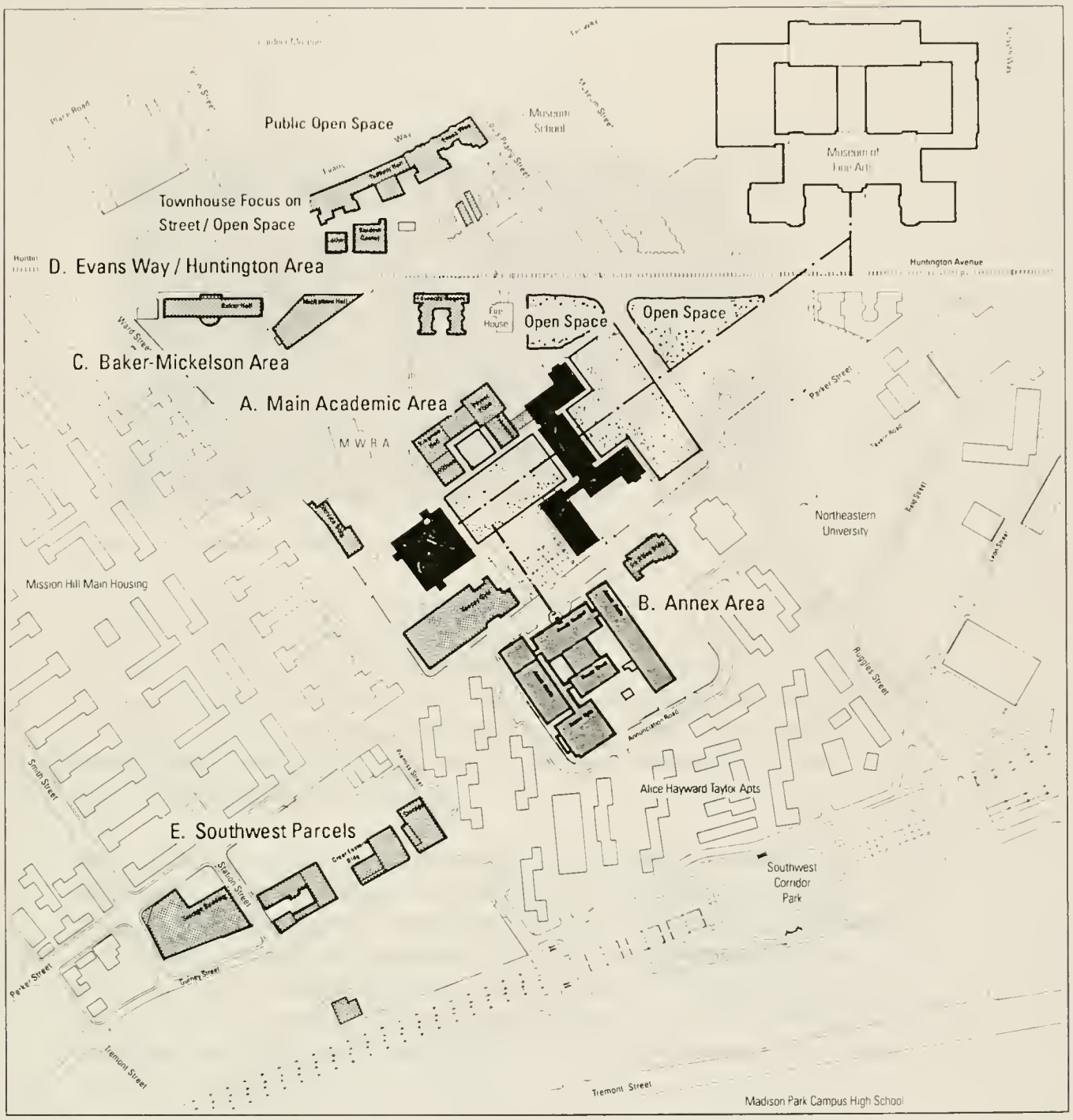


Figure 14. Wentworth's prominent edifice facing Ruggles Street and Huntington Avenue.



Wentworth Institute of Technology
Boston Campus Master Plan

Existing Spatial Structure and Precincts
Figure 13

0 100 200 400

Existing Wentworth Buildings
Architecturally Defined Open Space

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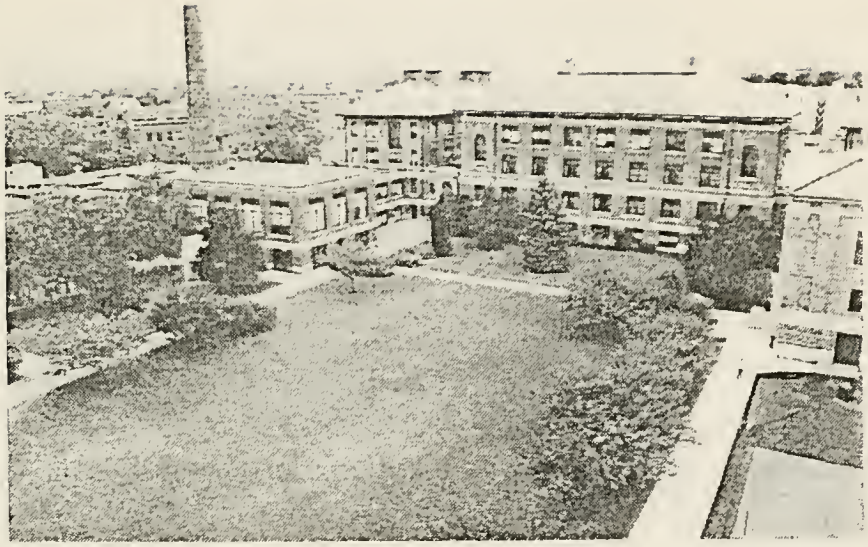


Figure 15. The Quadrangle, Wentworth's primary internal campus open space.

This basic structure is apparent because of a bilaterally symmetrical system imposed by the original campus plan, which is reinforced by the classic or academic style of the Institute's first buildings. Beatty Hall, although completed in the 1970's with a radically different architectural expression, reinforces the campus structure by providing closure to the quadrangle. Further, Beatty Hall's disposition as a multi-purpose center of student activity--dining center, retail center, classroom facility and library--gives it a functional and symbolic importance.

Several of the projects proposed in the five-year plan will significantly enhance the character and clarity of the Main Academic Area. First, the improvements to the Ruggles Street entrance will give greater definition to the front-door arrival and drop-off area. The double ingress and egress lanes will provide an arrival court of generous proportion that is consistent with the original scale and design intent of the Peabody and Stearns plan for Wentworth. The symmetry of architectural expression and plan organization are reinforced, and pedestrian paths are fully integrated with the existing patterns of access and use.

Second, proposed improvements to the West Lot parking area will provide a more integrated pedestrian connection between the academic core and Huntington Avenue. The alley adjacent to Edward/Rogers is proposed to be upgraded and a pathway is to be constructed through the lot to provide a clear and safe passage for pedestrians.

Figure 16. Improvements in the West Lot will provide a safer and more clear pedestrian pathway to Huntington Avenue.

In addition to these two projects, the plan seeks to clarify and improve upon the role of the quadrangle as the central open space of the Wentworth Campus. Recommendations include:

- provision of a widened campus walkway between Beatty Hall and the CDC, to respond to the increased importance of the Annex and the significant levels of student traffic along that route.
- provision of access to Wentworth Hall at the originally-intended southwest doorway that would open up to the Quadrangle and greatly enhance circulation patterns in the core.
- increased emphasis on a high deciduous tree canopy as the main planting theme, which would be more consistent with the traditional American campus quadrangle; deemphasis of evergreen and low flowering species that tend to obscure sightlines.
- recognition of existing desire-line pathways across the Quadrangle, while still preserving an open lawn with perimeter canopy trees as the dominant theme.

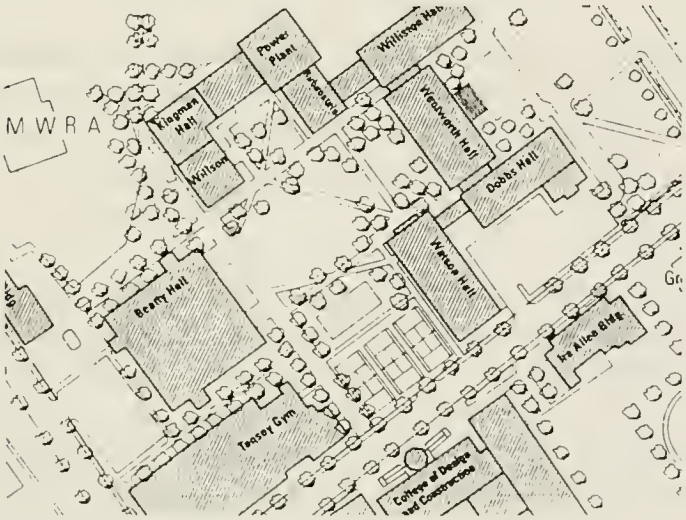


Figure 17. Plan of the Quadrangle.

B. Annex Area, College of Design and Construction

With the significant rehabilitation of the buildings housing the College of Design and Construction, the Annex area will continue to be one of the primary centers of activity and a chief component of the campus structure. In addition to the new internal courtyard spaces proposed in Phase IB of the CDC, the Master Plan recommends several improvements:

- Elimination of parallel on-street parking immediately in front of the Annex;
- Narrowing of the street cross-section to provide for improved pedestrian safety and legibility, in view of the large numbers crossing Parker Street during class-change intervals;
- Widening of the main walkway between Parker Street and Beatty Hall.
- Provision of new street tree plantings along Parker Street and Annunciation Road.

In the long term future, the most significant move towards integrating the College of Design and Construction with the Quadrangle and other primary academic facilities would be to relocate the three intercollegiate tennis courts to a less intrusive location. This would allow a more direct connection towards the main facade of the Annex, and would create a dynamic spatial structure in relation to the existing Quadrangle.

C. Baker-Mickelson Area

This area is physically separated from other precincts due to the intervening Mass College of Art-MWRA property and the presence of Huntington Avenue as a major thoroughfare. Baker Hall has an orientation to Huntington Avenue, with no close connection to other housing units and no relationship to useable open space. This isolation is compounded by the presence of parking on the balance of the Baker site, as well as adjacent Massachusetts College of Art parking areas.

The capacity for expansion of housing on the Baker site may be significant and could be seen as an opportunity to improve the physical and social character of the dormitory location. Further, Mickelson Hall provides accommodation of important non-residential program functions, but in its current configuration is a low-capacity use of a site in a prime location.

The intended discussion with Massachusetts College of Art recognizes open space improvements and/or land exchanges that could significantly benefit the Baker-Mickelson area. An alternative improvement in the West Lot could be facilitated by providing a more direct link to the campus core, cutting across the land southeast of Mickelson Hall. Pedestrian traffic from the core would then be directed through the Baker-Mickelson site, and linked to Huntington Avenue precisely at the safe crossing point, opposite Tetlow Street. This is the preferred option for improved pedestrian

linkages. It should be a primary goal of any future agreements surrounding the Massachusetts College of Art parking area.

D. Evans Way/Huntington Area

This area is composed of residential, office and recreational facilities, including Tudbury Hall, Evans Way, Collins Hall, and the Student Center. Due to their origins as private residential developments prior to Wentworth acquisition for most of these facilities, the residential components are primarily of an urban townhouse type in their orientation to a streetfront, with a rear service alley and 3- to 6-story configuration. This housing group also has the significant amenity factor of location on a major Boston open space, the Evans Way entrance to the Back Bay Fens. The Student Center is an important campus function, but its location away from the academic core results in low use. Additionally, its small profile and diminutive architectural character do not contribute significantly from the standpoint of spatial structure or urban character of the Huntington Avenue corridor.

While no major initiatives are planned for this area in the Five-Year Plan, other five-year projects and other long-range objectives will help integrate Evans Way with the rest of the campus. The West Lot improvements will clearly benefit pedestrian access for Evans Way residents. The Edwards-Rogers feasibility study, along with future determinations with respect to accommodating a larger percentage of Wentworth student housing on campus, will help focus on integration strategies in this precinct.

E. Southwest Parcels

Parking strategies in the Five-Year Plan include reopening the Parker Street lot to accommodate Wentworth commuter parking that will be displaced by the construction of multi-purpose field space at the Triangle parcel. Given historical factors of only moderate parking utilization, as well as the relatively recent relocation of parking accommodation to the Triangle parcel, the success of this strategy is dependent on improved security and increased perception of convenience as a campus parking facility.

Measures that would improve security and convenience include upgraded perimeter fencing, uniform lighting conditions for surveillance and safety perception, and signage identifying the property as part of the Wentworth campus. Additionally, the Parker Street corridor should be upgraded with street tree plantings that help improve the sense of clarity and connection along the street.

3. *Urban Design Structure*

Given its location within a diverse and complex urban environment, future development of the Wentworth campus is guided to some extent by the urban design characteristics of the neighboring precincts. These characteristics include the predominating street patterns, the bulk, density and height of buildings, the architectural character, the arrangement of land uses, and those factors of the environment that serve to orient people as they move through the city. The following discussion highlights several urban design factors that are critical to understanding Wentworth's urban context.

Street Patterns

A distinct characteristic of the Fenway-Mission Hill area is its irregular block structure. This characteristic results from a complex overlay of street patterns from different eras of planning and development. The predominating block pattern to which the original Wentworth plan was oriented was that defined by Parker Street and Ruggles Street, a right-angle grid running roughly north-south. In the mid-19th century, when the area was mostly residential, Parker Street was the principal collector street in this precinct, with the much older Tremont street being the main artery to downtown Boston. During the 1880's, Huntington Avenue was extended through the precinct as a new westerly route, and by the turn of the century it became a primary route to the growing western suburbs. Huntington Avenue cut through the existing grid, creating a new set of geometries and new development opportunities. The odd-shaped building parcels that resulted proved most suitable to institutional uses and monumental edifices, such as the Museum of Fine Arts and Wentworth Institute.

Huntington Avenue remains the principal boulevard and artery that provides recognition for Northeastern University, the Museum of Fine Arts, Mass College of Art, Wentworth, and many of the hospitals that converge further to the west. The old north-south grid defined by Parker and Ruggles was eroded in the 1950's in an effort to provide a contrasting, internal open space structure to the Mission Hill housing developments. As a result, strongly perceived edges exist between residential and other uses in the area. This factor is heightened for Wentworth along Ward Street, Annunciation Road, and in the area of the southwestern parcels near Prentiss and Station Streets.

Urban Design Concepts

As a major institution among numerous institutional, residential and commercial neighbors, Wentworth recognizes that it is a participant in shaping the urban environment that extends beyond the confines of its internal campus structure. Following are a series of issues that continue to influence the planning process and that identify the essential urban design influences on the Five-Year Plan and beyond.

A. Affirmation of Wentworth's Image and Presence

While the buildings and spaces of the Wentworth campus contain a diverse mix of styles and functions, collectively they represent an institutional presence and a major activity generator in the community. As illustrated in the discussion of campus historical development, Wentworth inherits a notable claim to an established visual edifice on one of the city's major boulevards, Huntington Avenue. Several of the Five-Year Plan projects serve to strengthen the presence of Wentworth within the urban context as follows:

- Development of the Triangle parcel as multi-purpose open space preserves the formal tenets of Wentworth's original plan. With a classically disposed main facade and arrival court that is analogous to, and axially linked to, that of the Museum of Fine Arts, Wentworth retains its strong visual presence and helps give imageability and identity to the entire urban precinct. The proposed field space essentially reserves the Triangle as an open, unobstructed space between Wentworth's front door and Huntington Avenue. Reduction of parking capacity also improves the disposition of this parcel relative to visual quality and vehicle circulation.

- Improvements to the vehicle entrance on Ruggles Street enhance the visual axis and symmetry of the foreground at the Institute's front door, and give increased clarity to the image projected to the neighboring public and the campus community.

- The College of Design and Construction project solidifies Wentworth's presence on both sides of Parker Street and improves pedestrian linkage between campus precincts.

B. Integration With the Urban Structure

The extensive and fragmented nature of Wentworth's landholdings demands recognition of the overall structure of the urban grid of streets and blocks. Huntington Avenue, Parker Street and Ruggles Street are all major arteries or collector streets that cut through the Wentworth campus and affect its image and function.

- Huntington Avenue has long been a major boulevard and a premier address for some of the city's most prestigious institutions. The design strategies of the Five-Year Plan projects reassert Wentworth's physical presence on Huntington. In addition to the five-year projects, Wentworth supports long-term goals for improving the quality of Huntington as a boulevard, including the re-establishment of a suitable street tree canopy, better accommodation of pedestrian crossings and

sidewalks, and other related public environment improvements. The future of the Edwards-Rogers site and other long-term initiatives would also be guided by the goals of improving Huntington Avenue as a major urban boulevard and as a campus open space element.

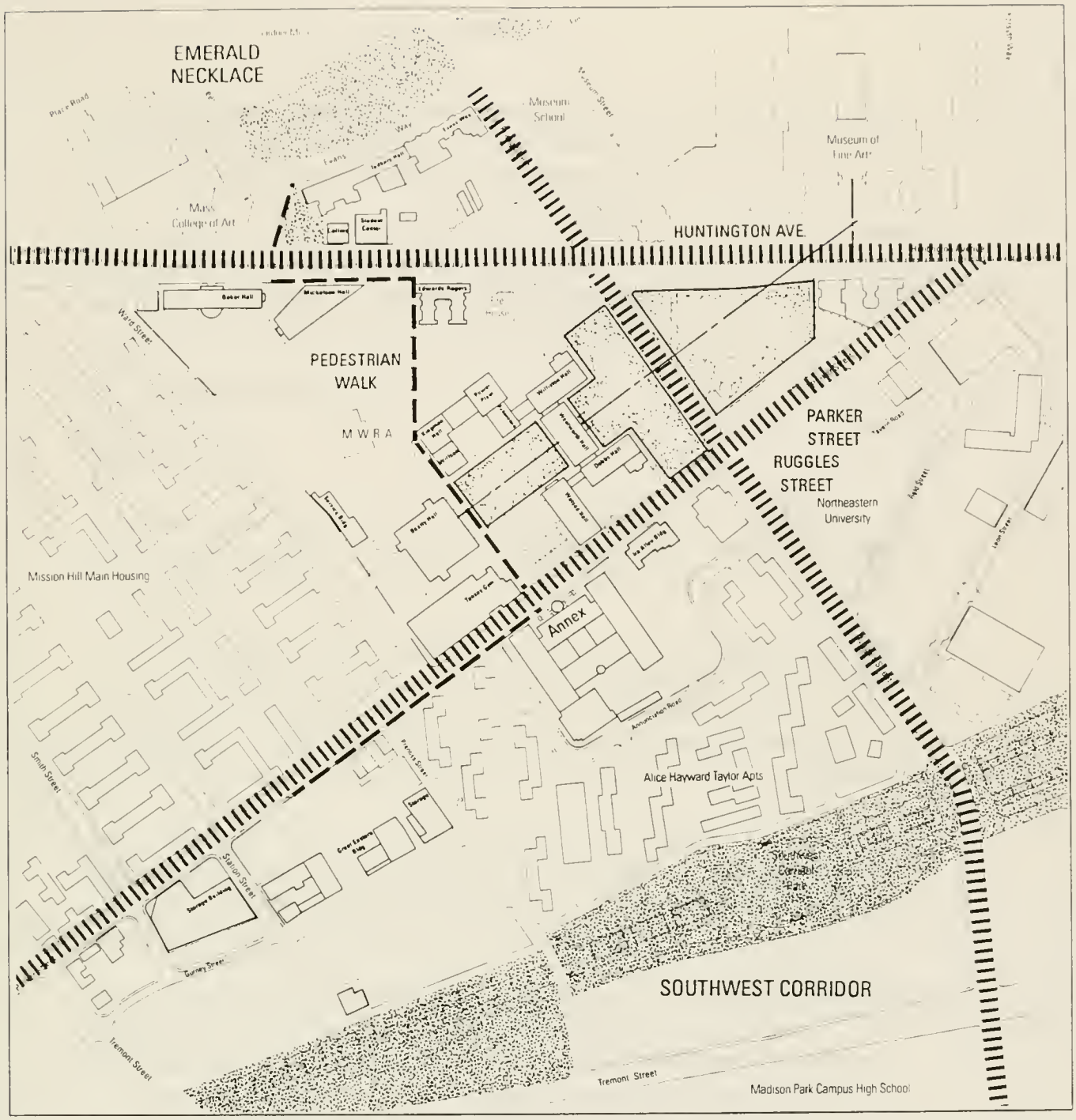
Figure 19. Huntington Avenue is a major urban boulevard as well as a component of the campus open space system.

- Parker Street was important in the 19th century as a primary route from the city towards Parker Hill and the surrounding ex-urban communities. While it was replaced in part by Huntington Avenue in its role as a metropolitan connector, it does play a role as a local collector and neighborhood route. Improvements to the Parker Street (southwest) parcels, the connecting segment between Prentiss and Ward Streets, and the CDC project all stand to upgrade the quality of Parker Street in the vicinity of Wentworth.

- Ruggles Street is a major artery connecting the Fenway area to other city sectors and to transportation corridors. Wentworth supports the proposed widening of Ruggles, and sees potential benefits in coordinating this widening with the construction of its proposed entrance revisions on Ruggles. It is anticipated that the proposed widening will improve through-vehicle movements, improve levels of service at intersection turning movements, and establish a better pedestrian environment for the community and the campus. The importance of this project to the planned redevelopment of Parcel 18 and Parcel 22 is clear.

C. Integration With Urban Open Space Structure

Along with recognition of the street as a primary component of urban open space, Wentworth acknowledges its proximity to two of Boston's most important open space systems. Both the Emerald Necklace (including the Back Bay Fens) and the Southwest Corridor help to give shape and identity to the area, and the Wentworth campus



Wentworth Institute of Technology
Boston Campus Master Plan

Urban Design Concepts
Figure 18

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Campus Open Space
Regional Open Space
Major Street Corridors

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April, 1991

contains links to both. These links are recognized in the campus open space strategies through emphasis on Ruggles, Huntington and Parker Street as connecting corridors that serve both the campus community and Wentworth's neighbors.

Additionally, the proposed use of the Triangle parcel for multi-purpose open space adds significantly to the recreation resources and the visual clarity of the area. To the extent that Wentworth informal or intramural groups use non-Wentworth facilities presently, the new fields will relieve pressure on the public facilities in the vicinity.

E. ENVIRONMENT

Existing Conditions

Wentworth is located in an area that is developed at urban densities, supports an extensive street and mass transit network, exhibits a wide range of land uses (residential, institutional, commercial) and is underlain partially by filled land.

The development pattern in this area has typically produced high percentages of site coverage with impervious surfaces and little remaining open space. Streets, parking and mass transit facilities occupy a significant portion of the land area. However, Wentworth (and the other area institutions) provides some balance in the form of on campus open space as well as that in the Fenway and Southwest Corridor parkland.

Background traffic levels are quite high along Huntington Avenue, Parker Street and Ruggles Street. Noise, emitting of air pollutants and pedestrian safety are all existing issues with these vehicular movements. However, Wentworth's contribution to traffic is quite small compared to the total number of vehicles.

The mix of land uses presents potential conflicts from the perspective of; competition for housing between students and community residents; operational needs (service/deliveries) of institutions and commercial development versus the relative sensitivity to noise and vehicular traffic of residential areas; and the potential for scale/mass disparities between institutional buildings and those of adjacent neighborhoods.

Because much of the area in and around campus is filled land, poor drainage (i.e. high water table) and foundation construction difficulties are evident. Poor drainage of stormwater can cause minor flooding and backups during spring high tide conditions. High water table can be addressed in foundation design but typically requires premium costs for waterproofing, etc.

The Plan has the beneficial effect of reduction in paved surfaced by introducing playing fields on the Triangle site. This also contributes towards a better balance of useable open space with the built environment and reduces Institute demands on adjacent public field space. The CDC renovation/addition will add a modest amount of building square footage. However, the bulk of this will be generously setback from Annunciation Road in the new building connecting the north wing and south wing and will be at a similar height to that of the existing buildings. The proposed extension of the roofline of the south wing (Bldg. 23) will also be in keeping with the existing building design and be unobtrusive to adjoining properties.

The Five-Year Plan does not increase the number of vehicle trips to campus as compared to those that currently take place (see Traffic and Transportation Management and Mitigation Plan section). In fact, the plan recommends policies that could contribute towards reduction in trips in view of the anticipated static enrollment. Pedestrian improvement projects are proposed by the Five-Year Plan (West Lot improvements, Parker Street crossing zone, public streetscape improvements, etc.). These will help to address issues related to pedestrian safety as well as quality of the walking environment.

Off-campus housing demands by students has slackened considerably in the last two years. Reflective of the broader rental housing market trend, vacancies are higher than in many years. Similarly, the Institute has vacant beds. The Institute recognizes the cyclical nature of student housing demand and is monitoring the supply/demand carefully. With an increased geographic range of potential students to maintain enrollments, the Institute foresees that demand for on-campus housing will begin to rise again in the next few years. Feasibility evaluation of Edwards/Rogers is an initial step towards managing Institute housing resources in response to demand. The lack of enrollment growth over the five-year period will dampen potential student housing demand in any event.

The multi-family rental housing units recently purchased by the Institute on Vancouver Street (#9 and #15) will be maintained as private housing during the near-term planning period. In fact, since purchasing these units, the Institute has reduced rents on individual units. Thus, these units will be maintained in the neighborhood supply.

The reduction in impervious surfaces on-campus represented by the playing fields on the Triangle will incrementally improve the stormwater conditions by reducing flows compared to existing conditions.

IV. WENTWORTH BEYOND FIVE YEARS

Introduction

Wentworth Institute of Technology will continue to work with the City and adjacent neighborhoods beyond the five year time horizon to continue to establish common goals related to physical improvements to the campus and environs, traffic and parking concerns and targeted educational programs and skill training that the Institute can offer. The Institute does not envision any fundamental changes to the mission, enrollments or programs for long-term planning. The Institute will continue to respond and adjust to demographic trends, facility needs and funding availability to pursue the goals that are described in the following text.

The long-term planning strategies are focused on the continuing consolidation of the Institute's facilities within it's current outer boundaries. With static enrollment overall, the need for geographic expansion is not called for nor is it included in the strategic intentions of Wentworth. In fact, similar to the Five-Year Plan, Wentworth will continue to focus energies on facility quality issues and the consolidation of existing facilities. However, given existing space shortages and an overall objective towards becoming a polytechnic institution, some new construction is likely.

Academics

While long-term enrollments are planned to be maintained at roughly 4,000 total students, shifts in enrollment between various disciplines is likely but difficult to predict. The Institute's administration envisions the emergence of new academic programs not as singular program objectives, but as initiatives towards becoming a polytechnic institution where a wide variety of technical areas, multidisciplinary studies and a balance of humanities/social science programs are offered.

Increasing numbers of Bachelor degrees and possibly other advanced degrees will be considered. The impact on academic facilities will be the continuing renovation and updating of instructional and faculty office space. This will likely include the reassignment of departments and disciplines among the campus buildings to achieve desired adjacencies.

Based on a review of existing library space and the above initiatives, expansion of the library will be necessary for additions to the Institute's bound volume collection and study space. This may take the form of a new library/resource center building, depending on the exact program needs that currently are only generally defined.

Student Housing

The Institute will continue to monitor student housing demand in terms of type and amount. In the longer-term outlook, to maintain enrollments the Institute will likely have to recruit students from a larger geographic base and this may contribute towards additional housing demand.

In the longer term, the Institute's administration has established a goal of 50 percent of the full time students to be housed in on-campus facilities. This would represent an increase of approximately 530 beds over the existing on-campus student housing supply and at existing enrollment levels, reduce the commuting student population from 68 percent to 50 percent of total enrollment.

The results of the Edwards/Rogers feasibility study will define the mid-range strategy for student housing. Should the option for renovation for continued use as student housing not be selected, construction of a new student residence facility would be required to maintain the existing student bed supply.

Student Services

Currently, the Institute's campus has a relatively short supply of student activities/services space. As the campus continues to be developed additional space in a central location convenient to the resident and commuter student alike will become necessary and desirable.

Given the location across Huntington Avenue of the existing Student Center near housing and those student support services that are in Beatty Hall, the Institute recognizes that each facility is likely to have a continuing role. However, Beatty Hall is a preferable choice for overall expansion of student services. It is centrally located, can provide for both commuter and resident students and, if a new library were built, a significant amount of space would be released from Beatty Hall that could be recaptured for student services.

Athletics/Recreation

The field space proposed for the Triangle parcel in the Five-Year Plan will meet a certain segment of the athletics/recreational needs of the Institute. Additional field space and support facilities for competition, practice and intramurals may prove necessary in the long-term. In addition, the field space being proposed for the Triangle parcel may be considered a location that only partially satisfies needs with more comprehensive indoor/outdoor facilities developed on the larger Parker Lot area in the future.

Open Space/Pedestrian Systems

One of the fundamental concepts for long-term campus development is the continuing improvement in the function, safety and aesthetic appearance of the campus open space network and the pedestrian walkways. The Institute is concerned with both on-campus areas and those public areas adjacent to and around the campus used by students, faculty, staff and neighborhood residents. The condition and design of the public environment (street, sidewalks, plantings, lighting, signs) along Huntington Avenue, Parker Street and Ruggles street are of paramount interest to the Institute. To the extent that Institute initiatives may desire to place new buildings along the Huntington Avenue frontage, attendant site improvements will be undertaken to continue to address pedestrian paths and the overall urban design qualities of this important corridor. Coordinated planning efforts with the Massachusetts College of Art in the Baker-Michelson area are intended to rationalize the pattern of buildings, parking, open space and pedestrian movement.

Traffic and Parking

The Institute will remain vitally concerned about the condition and quality of vehicular movement in and around the campus environs. In addition, initiatives for students, faculty and staff to use mass transit will continue to be made (T-pass subsidy, etc.) to reduce parking demand and vehicle trips to the extent possible. In part this is dependent on the quality of the walking environment along public streets from mass transit facilities. The provision of adequate on-campus housing will also be a factor in minimizing Institute-related vehicle trips.

As the campus develops and pedestrian improvements are made certain adjustments are likely to occur in the parking layout and location. The existing parking supply is all in surface lots and as such represents the remaining developable land base of the Institute. Over time it may be necessary to have a portion of the supply transition to a parking garage(s) as land area becomes a limiting factor to providing site area for necessary facilities.

Introduction

The Institutional Master Plan Requirements of the BRA include the preparation of a Transportation and Parking Management and Mitigation Plan. This component of the Master Plan includes analyses of the existing circulation system and parking supply, describes the impacts of all proposed institutional projects within the Five-Year Plan on these systems, and describes measures to reduce, mitigate, limit, or minimize impacts attributable to current and future proposed projects.

Summary of Transportation and Parking Effects of Five-Year Plan

The Wentworth campus is situated within a street network which carries very high vehicular volumes on both a daily and peak hour basis. The bulk of this traffic is comprised of through movements not related to Wentworth. The proportion of peak hour traffic volumes represented by vehicles related specifically to Wentworth is not significant when compared to the overall background traffic.

The transportation environment surrounding the Wentworth campus is characterized by a complex array of access and parking needs related to the many institutions and residential areas therein. Consideration has been given to the transportation impact potential of other pending development in the greater area of Wentworth in the preparation of this Five-Year Plan. Specifically, continued development of the Northeastern University campus and the Longwood Medical Area, and development of Parcel 18 for mixed-uses and Parcel 22 for a new Police Department Headquarters have been considered herein. Transit access is a prominent feature of the area's transportation environment by virtue of the MBTA Green Line which bisects the Wentworth campus on Huntington Avenue, and the Orange Line to the immediate south of the campus. The Ruggles Street Station on the Orange Line, also provides for commuter rail and bus transit opportunities to patrons and residents of the area.

Existing transportation access and parking supply characteristics of the Wentworth area that have influenced the development of the elements of the Five-Year Plan include:

- While most intersections in the vicinity of Wentworth operate at acceptable levels of service, the Ruggles Street/Parker Street signalized intersection is an exception and operates at Level "F" in the PM Peak Hour. A widening of Ruggles Street to four lanes, initiated by the City/MBTA in recognition of these existing problems and potential impacts of major development proposals on Parcels 18 and 22 to the south, is expected to improve the intersection operations at this location.

- Pedestrian circulation between campus facilities is constrained by vehicular-pedestrian conflicts resulting from the high volumes on public streets which border the campus.

- Wentworth currently provides an adequate number of parking spaces for students, staff and faculty who request parking permits. On-street public spaces augment the total available on-campus parking supply to a degree.

The potential effects of the elements of the Five-Year Plan upon these existing conditions include:

- Additional new vehicular traffic destined for the campus is not projected to occur because improvements and/or changes to campus facilities proposed as part of the Five-Year Plan are driven neither by student enrollment increases, nor by faculty and staff increases.

- A slight redistribution of vehicular movements in the immediate vicinity of the campus will result from relocation of a portion of the parking supply from the Triangle Lot to the Parker Street Lot and/or alterations to West Lot, East Lot, and visitor parking lot access points.

- A re-design of on-campus pedestrian pathways across West Lot to direct pedestrians to safe (i.e., signalized) street crossing points, and other changes to remove on-street parking in areas of high pedestrian crossing volume (Parker Street at the CDC) will help alleviate potential vehicular/pedestrian conflicts in the immediate vicinity of the campus.

- No new parking demands are projected to result from elements of the Five-Year Plan. A certain amount of relocation of parking spaces to the Parker Street Lot is projected to occur as a result of displacement of existing spaces on the Triangle Lot. The relocation may not replace all the displaced spaces. However, Institute efforts at reducing trips to campus and resultant parking demand are expected to address any differences. Wentworth will continue to encourage the use of transit among members of its campus population and consider instituting a T-pass subsidy.

- Removal of a certain number of public on-street parking spaces along Parker Street is expected to improve pedestrian crossings and assist the operation of the Ruggles/Parker intersection.

Campus Access

Existing Conditions

A. Vehicular Access

The Wentworth Institute of Technology campus is located southwest of downtown Boston. Available regional arterial and local streets make it reasonably convenient for members of the campus population to drive to campus. Regional vehicular access to the Boston campus is provided by the Southeast Expressway (I-93) to the east of the campus and the Massachusetts Turnpike (I-90) located to the north of the campus. These highways provide access to the campus from communities to the north, south and west of Boston.

Local streets which provide direct access to campus from the arterial highways and the surrounding area include Huntington Avenue, Ruggles Street and Tremont Street. More localized campus access is provided by Parker Street, which bisects the campus on a east-west alignment, and Ward Street, which forms the western boundary of the campus core.

Huntington Avenue, a major arterial roadway that bisects the campus, has two travel lanes in each direction in a generally northeast to southwest alignment. Parking is allowed along both edges. The MBTA Green line, a light rail transit line located within the central median, divides the directional flow in a shared right-of-way operation. There are no vehicular entrances to the campus property from Huntington Avenue and turning movements across Huntington Avenue are limited to major intersections.

Ruggles Street, an arterial roadway that also bisects the campus, is the principal north-south roadway in the campus area. Ruggles Street connects Huntington Avenue to Tremont Street to the south. Two travel lanes in each direction are provided between Parker Street and Huntington Avenue, and between Tremont Street and Leon Street. The balance of the street has one travel lane in each direction. Parking is not allowed along Ruggles Street, which provides direct access to West Lot, the faculty, staff and visitors parking lot.

Parker Street, which physically separates the campus academic core from the Annex complex and Ira Allen Hall, is the primary east-west collector in the campus area. There is one travel lane in each direction and parking is allowed on both edges of the street. Parker Street currently provides the primary access to parking on the Triangle parcel, to the East Lot and to the Parker Lot.

Evans Way is a minor collector street and provides access to the Fenway, a major east-west arterial to the north of the campus. Parking is allowed on both edges of Evans Way.

Ward Street, a local collector roadway, is aligned in a north-south direction and provides access to the Baker and Beatty parking lots. Parallel parking is allowed along the east edge and off-street parking serving the Mission Hill housing complex is provided along segments of the west curb.

Annunciation Road is a local road extending from Parker Street to Ruggles Street between the Annex and the Alice Hayward Taylor Apartments. It provides primary access to the Annex Parking lot. Parking is allowed on both sides of the street. Entrances to parking areas for the Alice Hayward Taylor Apartments are located along this street.

Prentiss Street, a local roadway with one travel lane in each direction, runs generally north-south between Parker Street and Tremont Street. Parallel parking is allowed on the west side of the street and there are areas on the east side of the street in which perpendicular parking is allowed for the Alice Hayward Taylor Apartments.

The principal signalized intersections in the vicinity of the campus that are influential to the planning process include:

- Huntington Avenue/Longwood Avenue
- Huntington Avenue/Louis Prang Street/Ruggles Street
- Ruggles Street/Parker Street
- Ruggles Street/Whitter Street/Tremont Street
- Tremont Street/Prentiss Street
- Tremont Street/Columbus Avenue/New Dudley Street
- Tremont Street/Parker Street

To gain a better understanding of how well these intersections currently operate within morning and afternoon peak traffic loads, existing traffic related reports were reviewed and manual traffic counts were conducted at the Tremont/Parker intersection. Traffic reports which were reviewed include those prepared for Northeastern University's Master Plan, the Parcel 18 DEIR, and the MASCO-sponsored Longwood Medical Area Transportation Study.

The quality of intersection operating conditions under varying vehicle volumes are generally described by standard "Levels of Service" (LOS) which identify an intersection's capacity to handle varying vehicle loads. In general terms, these levels are defined in a range between LOS "A" which represents free flow of traffic, and LOS "F"

which represents traffic jam conditions and lengthy delays. LOS "C" or better is generally considered an acceptable condition. Under urban conditions LOS "D" can be considered acceptable. LOS "E" is generally considered to represent operating conditions at or near the capacity of a given intersection.

Intersection levels of service are normally defined for peak hours of traffic volume during the morning and afternoon. In the vicinity of the Wentworth campus, these peak hours are generally between 7:30 and 8:30 AM, and 4:30 and 5:30 PM. *Table 3* presents the level of service results of capacity analyses conducted at Study Area intersections.

Table 3. Existing Levels of Service at Intersections

	AM PEAK HOUR		PM PEAK HOUR	
Intersection	**LOS**	**Avg Delay (sec)**	**LOS**	**Avg Delay (sec)**
Huntington/Longwood	D	28.0	D	32.0
Huntington/Louis Prang/ Ruggles	C	17.0	D	36.0
Ruggles/Parker	D	33.9	F	63.3
Ruggles/Whitter/ Tremont	B	11.1	C	15.2
Tremont/Prentiss	A	2.7	A	4.0
Tremont/Columbus/ New Dudley	C	17.5	C	24.0
Tremont/Parker	B	6.7	C	20.6

Table 3 displays that during the AM Peak Hour all Study Area intersections are operating within acceptable limits (LOS "D" and above). The Ruggles/Parker and Huntington/Longwood intersections have the least favorable operating condition of the intersections studied.

During the PM Peak Hour, the results of *Table 3* indicate that only the Huntington/Longwood and Tremont/Prentiss intersections maintain their AM Peak Hour LOS. All of the other intersections studied exhibit a decrease in the quality of operating conditions in the PM Peak Hour when compared to the AM Peak. The Parker/Ruggles intersection, for example, has PM Peak Hour operations at LOS "F".

Figure 20 and 21 illustrate the locations of *Table 3* intersections and indicate the overall LOS for each intersection as well as the LOS for each of the streets approaching the intersection.

The level of service calculations are based on existing geometric and operating features of the intersection (number of lanes, lane widths, signal timings, etc.) and the number of vehicles passing through during a given time period. It is recognized that other factors which cannot be as easily measured also influence the perceptions of motorists and include bus and truck traffic, road surface conditions, weather conditions, and quality of signage. For example, the MBTA Green Line in the median of Huntington Avenue adds a complicating factor to motorists at the Huntington\Ruggles\Louis Prang and Huntington\Longwood intersections.

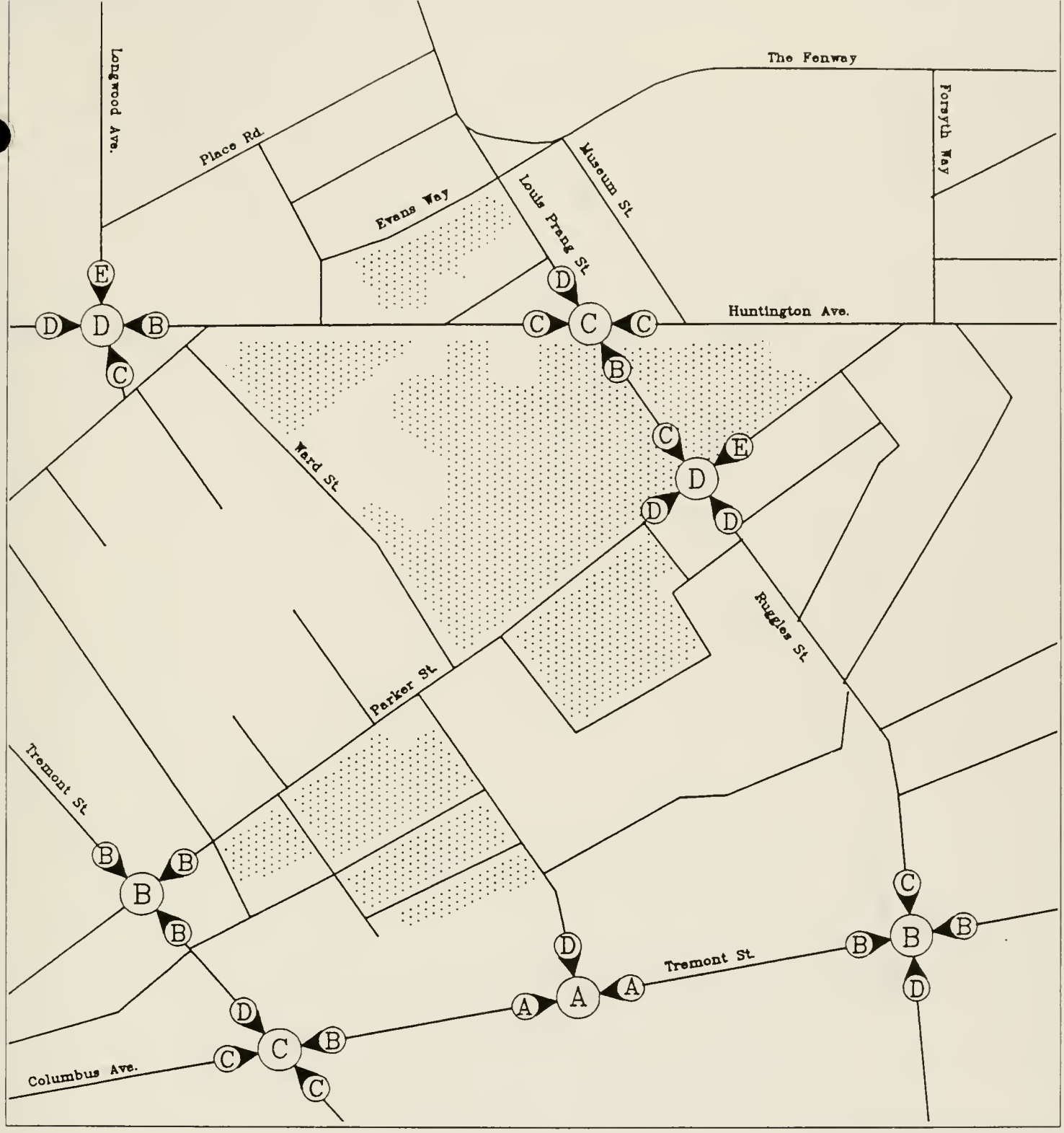
The Ruggles Street corridor is of particular concern because of the high volumes of traffic (both buses and cars) and relatively poor operation conditions at the Parker/Huntington intersection. The inconsistent pavement width and variable number of travel lanes along this street present significant limitations on the ability of the street to accommodate the existing traffic volumes. A plan to widen the street to four lanes between Huntington Avenue and Tremont Street, jointly sponsored by the MBTA and City of Boston, has been delayed due to budget problems and a date for implementation of the widening has not been established.

B. Public Transportation Access

Wentworth is well served by public transportation. The Arborway branch of the Green Line passes the campus within the median of Huntington Avenue. The Ruggles Street Station of the Orange Line, a multi-modal transportation station, is located one-quarter of a mile southeast of the campus.

The Arborway branch of the MBTA Green Line stops at Ruggles Street, serving Roxbury and Jamaica Plain via Forest Hills Station. At Forest Hills passengers may transfer to buses serving Dedham, West Roxbury, Hyde Park and Roslindale. The Green Line operates seven days a week, from 5:30 AM until after midnight, and runs on approximately eight minute intervals. The Green Line connects with the Red Line at Park Street, and with the Blue Line at Government Center, allowing access to the rest of the Boston metropolitan area's transit services.

The campus is also conveniently served by the Orange Line and commuter rail via Ruggles Station, located only one-quarter of a mile from the center of campus. The Orange Line runs on ten minute intervals during peak periods and runs between Forest Hills and Oak Grove. The commuter rail line is the Needham line between South Station and Needham Heights.



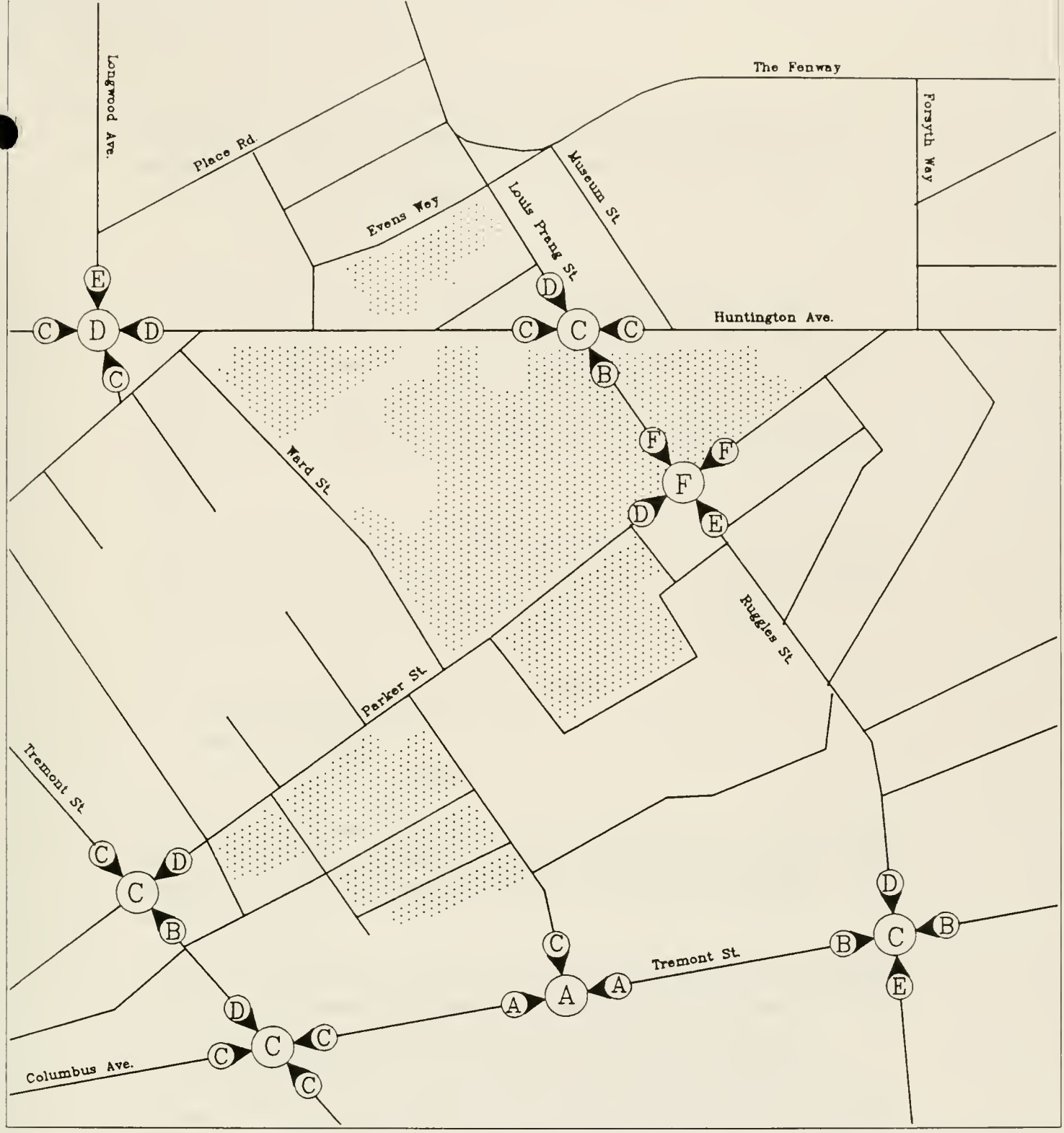
Wentworth Institute of Technology
Boston Campus Master Plan

Intersection Level of Service
A.M. Peak Hour
Figure 20

0 100 200 400

Wentworth Property

Sasaki Associates, Inc. *Campus Planning & Design*
Anthony Blackett *Space Programming*
McDermott / O'Neill & Associates, Inc. *Development Consultant*
April, 1991



Wentworth Institute of Technology
Boston Campus Master Plan

Intersection Level of Service
P.M. Peak Hour
Figure 21

0 100 200 400

Wentworth Property

Sasaki Associates, Inc. *Campus Planning & Design*
Anthony Blackett *Space Programming*
McDermott / O'Neill & Associates, Inc. *Development Consultant*
April, 1991

The Ruggles Street station is served by fourteen MBTA bus routes which are intended to provide feeder service to the Orange Line. In effect, these bus routes provide excellent access to Wentworth from their service areas, which include Roxbury, Roslindale, Mattapan and Dorchester.

C. Pedestrian Movement in Vicinity of Campus

The campus exists in a complex urban environment with a variety of pedestrian movements and vehicular traffic patterns around and through the campus. The major pedestrian movements studied include those pedestrian routes to campus and those routes within the campus itself. To gain a better understanding of the pedestrian movements, intersection crosswalk counts were conducted. *Figure 22* illustrates the existing pedestrian routes, desire routes and pedestrian crossing locations which were counted.

Pedestrian volumes were counted on October 4, 1989 between 7:30 and 11:30 AM and between 3:30 and 5:30 PM to determine the level of activity at key pedestrian crossing areas around campus. The following locations were counted in accordance with recommendations as defined by the Boston Transportation Department:

- Huntington/Ruggles/Louis Prang Intersection
- Ruggles/Parker Intersection
- Parker at the Annex
- Huntington/Tetlow Intersection

Figures 23 and 24 illustrate the AM and PM peak hour pedestrian volumes at the above locations. At the crossings studied, the road widths, and consequently crosswalk lengths, vary between 30 and 50 feet. However, crosswalks and sidewalks are generally a uniform ten feet wide.

Qualitative expressions of the operations of pedestrian crossings have been established by Pushkarev and Zupan in Urban Space for Pedestrians (1975). The manner in which the method evaluates pedestrian movements within crosswalks is a qualitative expression based on the amount of friction created within the crosswalk by the two opposing streams of crossing pedestrians. The ease and speed of crossing is at or above free-flow levels when the sum of the opposing streams is less than one person per foot of crosswalk width. Crossing speeds, and therefore crossing quality are accordingly impacted as the number of crossing pedestrians increases. At combined average flows of less than two persons per minute per foot of crosswalk space, operations are described as **open** or **unimpeded**. Flows of two to six persons per minute per foot of

crossing space are said to be **impeded** in terms of crossing speed and ease. Flows of seven to ten persons per minute per foot of crossing space are said to be **constrained**. *Table 4* displays resulting qualitative levels of service and the AM and PM peak hours for the crosswalks studied.

Table 4. Pedestrian Qualitative Level of Service

Crosswalk Location	AM/PM Peak Hour	Qualitative Level of Service
Huntington/Ruggles/Louis Prang Intersection	8:15-9:15/4:30-5:30	Unimpeded
Ruggles/Parker Intersection	7:45-8:45/4:30-5:30	Unimpeded
Parker at the Annex	7:30-8:30/3:45-4:45	Unimpeded
Huntington/Tetlow Intersection	8:30-9:30/4:30-5:30	Unimpeded

As *Table 4* presents, all crosswalks studied are Unimpeded in level of service. However, the perception of the crossing level of service at these intersections can be worsened by signal timing, vehicular volumes, and by the physical condition of the crosswalk.

Huntington/Ruggles/Louis Prang Intersection - As the "gateway" to Wentworth this intersection's crosswalks are frequently used for pedestrian crossing by students and faculty. The Wentworth facilities on both sides of Huntington Avenue and the MBTA Green Line make this an active crossing area. As indicated by Wentworth's Transportation Survey, 42 percent of campus non-driving commuters approach campus from the Museum Stop of the Green Line. The qualitative measure of the four crossings making up this intersection is Unimpeded. However, most of the pedestrians arriving from the MBTA platform shortcut the provided crosswalks and walk from the Huntington Avenue median directly to the southwest corner of the intersection (see *Figure 22*). This shortcut is potentially unsafe and adds to the confusion at this busy intersection.

Ruggles/Parker Intersection - The pedestrian counts collected indicate the northeast crosswalk of Parker Street is the most active crosswalk at this intersection. This can be attributed to the volume of commuters exiting the Ruggles Street station and walking northwest to the various Institutions and businesses in the area. The transportation survey indicates that 35 percent of the Wentworth non-driving commuting population arrive via the Ruggles Street station. Pedestrian volumes counted at the Ruggles/Parker intersection would appear to include these Wentworth commuters. However, pedestrians walking from the station bound for destinations on the southwest side of

Wentworth Institute of Technology
Boston Campus Master Plan

Pedestrian Paths
Figure 22

0 100 200 400

Pedestrian Routes
Routes not on Walkways
Desired Routes with Physical Barrier
Major Pedestrian Crossing Zones

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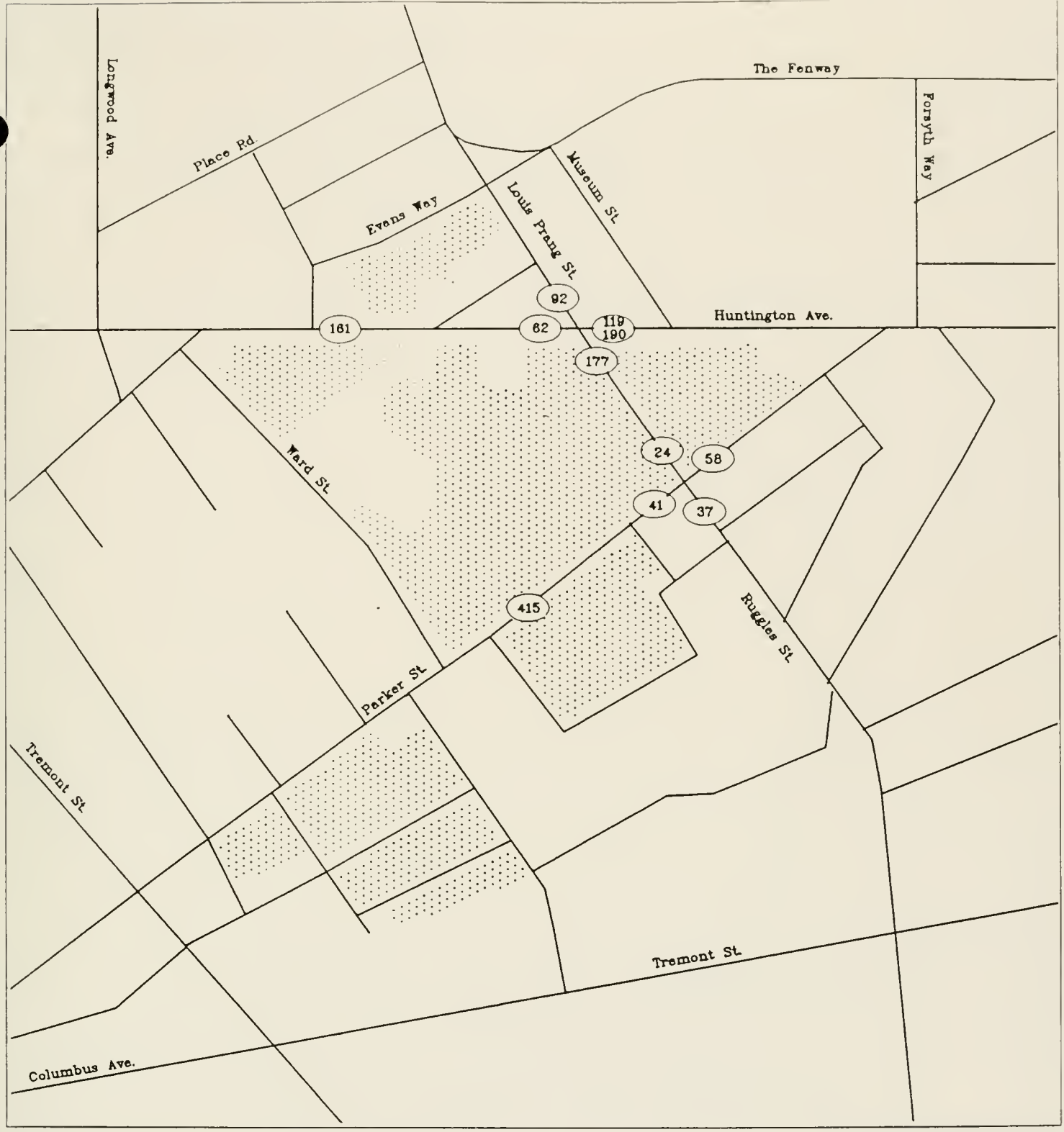
Anthony Blackett *Space Programming*
McDermott / O'Neill & Associates, Inc. *Development Consultant*

April, 1991



Wentworth Institute of Technology
Boston Campus Master Plan

Pedestrian Peak Hour Total
A.M. Peak Hour
Figure 23

0 100 200 400

Wentworth Property

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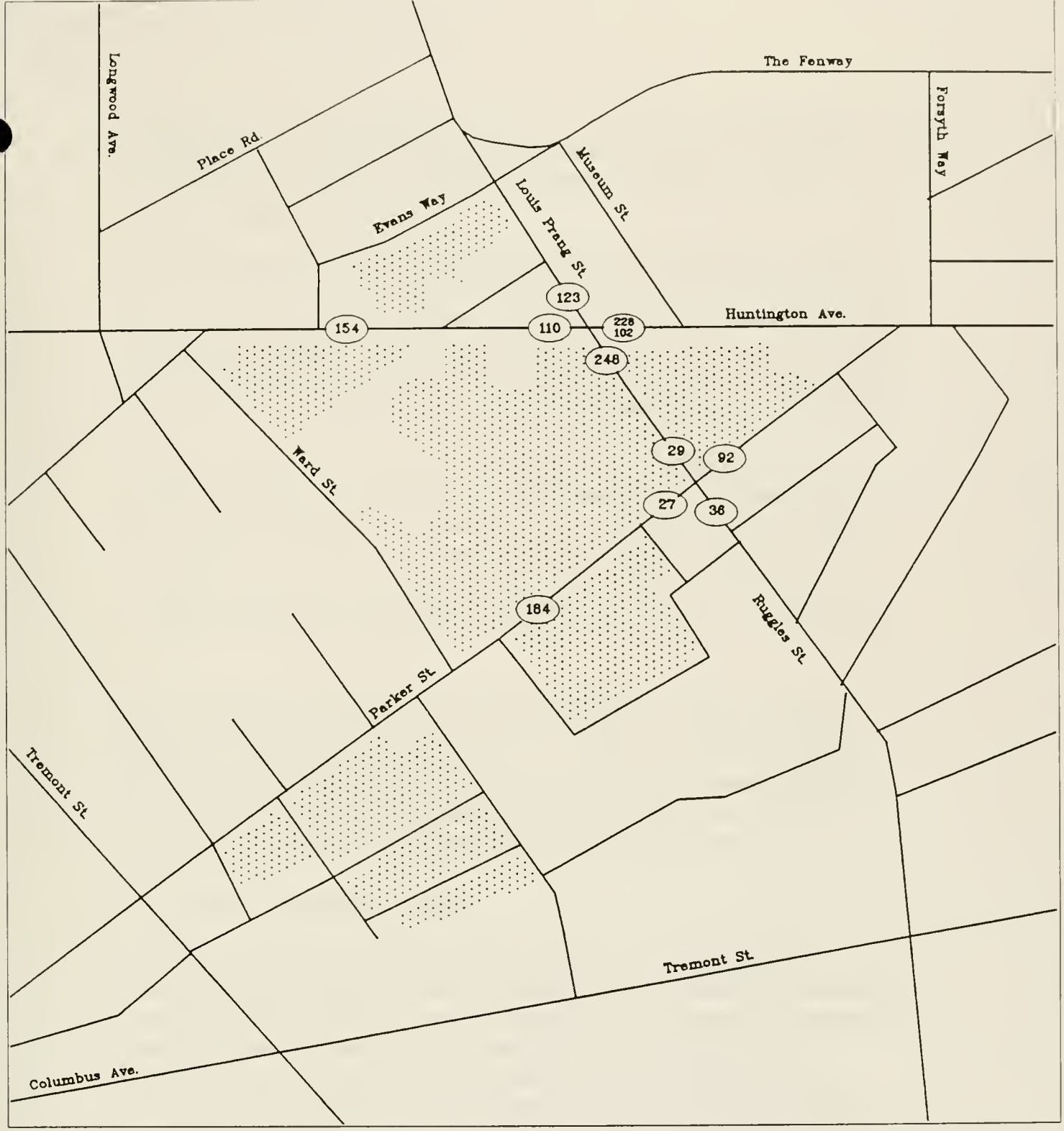
Anthony Blackett *Space Programming*
McDermott / D'Neill & Associates, Inc *Development Consultant*
April, 1991



Wentworth Institute of Technology
Boston Campus Master Plan

Pedestrian Peak Hour Total
P.M. Peak Hour
Figure 24

0 100 200 400

Wentworth Property

Sasaki Associates, Inc. *Campus Planning & Design*
Anthony Blackett *Space Programming*
McDermott / O'Neill & Associates, Inc. *Development Consultant*
April, 1991

Ruggles Street tend to cross Ruggles Street before the intersection of Ruggles/Parker. One pattern observed being used by pedestrians bound for the Wentworth campus was to shortcut the Ruggles/Parker intersection and walk behind the Greek Orthodox Church toward Edgar Street.

Parker Street at the Annex - This crossing was the busiest surveyed and the one most affected by the Wentworth population. There are high volumes of pedestrians crossing between the campus core and the facilities south of Parker Street within short periods of time during class changes. The AM Peak Hour (7:30 to 8:30 AM) was the earliest Study Area Peak due to the student/faculty arrivals for classes beginning at 8:00 AM. The PM Peak Hour (3:45 to 4:45 PM) was also the earliest peak of the Study Area intersections.

Huntington/Tetlow Intersection - The northeast crosswalk of Huntington Avenue is used by pedestrians to cross between the campus housing and other facilities on the north side of Huntington Avenue. Commuters that park in the Massachusetts College of Art parking lot on the MWRA property also cross Huntington Avenue at this location. Due to signal timings and traffic volumes, pedestrians often do not have enough time to make their complete crossing movement and must wait to do so within the median on Huntington Avenue.

Other crossings of Huntington Avenue take place mid-block at Edwards-Rogers Hall, and in part result from the existing pedestrian path through West Lot and to the immediate west of Edwards-Rogers which delivers pedestrians to a mid-block point at which many cross eastbound Huntington Avenue, jump the fence separating the pair of MBTA Green Line rapid transit tracks, and continue across westbound Huntington Avenue. This creates an unsafe and illegal pedestrian crossing situation.

D. Pedestrian Movement on Campus

A desirable attribute for a campus is a pleasant environment for students and faculty/staff during their time on campus. A major factor in the quality of the campus environment are the walkways between campus facilities. At Wentworth the pedestrian walkways are generally well laid out, with some problem areas associated with pedestrian movements through parking lots and crossings of heavily traveled public streets. There are three major pedestrian movements within the campus as described below:

- Between campus housing and the Campus Core
- Between Campus Core and The Annex
- Within the Campus Core

Campus Housing to Campus Core - This route is taken by resident students of Wentworth housing and other pedestrians walking between Wentworth facilities on either side of Huntington Avenue. The students living in Edwards/Rogers pass through the narrow alley between their housing and the MWRA property, and through the West Lot, without clearly defined pedestrian walkways. Students living in Baker Hall proceed on Huntington Avenue through the alley and the West Lot. Evans Way residents cross and proceed on Huntington Avenue and through the alley and West Lot . They arrive at the core either through Williston Hall or between the MWRA property and Williston Hall. This route through West Lot is potentially unsafe, difficult to maneuver and not attractive for the pedestrian.

Campus Core to The Annex - This pedestrian route between the facilities on either side of Parker Street is the most heavily traveled on campus. The crossing of Parker Street is unsafe because it is not clearly defined and happens at various points between the south end of the Annex and the north end of Ira Allen. This is further complicated by cars parked along Parker Street which reduce both motorist and pedestrian vision. The other problem area along this route is in front of Tansey Gym. This area between the basketball courts and the Tansey Gym entrance is small, congested with students, and as a result is difficult to maneuver during class change periods.

Within the Campus Core (Wentworth Hall/Beatty Hall) - The pedestrian paths within the Quad are the most clearly defined and visually pleasing on the campus. There is clear access to the Quad from other walkways from West Lot, the Annex, and the Physical Plant area. However, when moving between Wentworth Hall and the Quad there is no centrally located access onto the Quad from this building.

Other principal pedestrian paths on the campus include those from the campus core to the parking supply on the triangular lot bound by Huntington Avenue, Parker Street, and Ruggles Street; and, when open to parking, from the campus core to the Parker Street Lot. Although both parking lots are within convenient walking distance from the core, the perception is that walking between the core and the Parker Lot is less desirable than to other campus lots.

Potential Effects of Five-Year Plan on Campus Access

The regional and local roadway network which currently serves the Wentworth campus will continue to constitute the principal means of vehicular access to/from the campus. New vehicular traffic destined for the campus is not projected to increase significantly over that currently generated because improvements and/or changes to campus facilities as part of the Five-Year Plan are driven neither by student enrollment nor staff and faculty increases. It is not projected that the total campus population will change significantly over the five year period, but rather enrollment and staff/faculty employment opportunities are projected to stabilize at current levels.

Current campus related trips are quite small when compared to the overall background traffic. Wentworth provides a total of 768 parking spaces. If 70 percent of these spaces were to be occupied by 8:00 A.M. which according to the ENO Foundation for Transportation (1982) is the norm at U.S. institutions of higher learning, this would represent a total maximum of 538 total trips to the campus during the AM Peak Hour. For example, the Huntington Avenue/Ruggles Street signalized intersection has a total vehicle volume during the AM Peak Hour which approximates 2,750 vehicles. The campus access distribution suggests that about 55 percent of vehicles trips to Wentworth pass through the Huntington Avenue/Ruggles Street intersection, or about 296 vehicles trips in the AM Peak Hour. This volume of 296 vehicle trips represents only 11 percent of the 2,750 total trips that use the intersection during the AM Peak Hour. Furthermore, 296 vehicle trips represents only about 13 percent of the total 2,200 vehicle trips which pass through the Ruggles Street/Parker Street intersection in the AM Peak Hour. Thus, for every Wentworth-related trip in the vicinity of the campus during peak travel periods, there are potentially eight or nine non-Wentworth trips passing through or by the campus. Since the Five-Year Plan does not project increased number of trips, the same pattern as described above is expected to continue with minor adjustments based on proposed changes to campus parking resources.

Specific effects on campus vehicular access of the proposed projects of the Five-Year Plan include:

A. CDC Renovation/Addition

Improvements to and expansion of existing space in the Annex complex housing the College of Design and Construction for accreditation purposes is not projected to result in additional vehicle trips to the campus because no overall increase in student enrollment or staff/faculty employment is projected. Thus, this project will have no influence on existing traffic patterns. However, with the renovations and addition to this facility, improvements to the Parker Street crossing become increasingly important for pedestrians.

B. Recreational Field Development on Triangle Parcel

Development of athletic/recreation facilities on the Triangle site will displace approximately 151 of the existing 191 parking spaces on the site, which will result in some alteration to vehicular access trip patterns on roadways in the immediate vicinity of the campus. Thus, field space development on the Triangle site will trigger the reopening of the 131-space Parker Lot to the west on Parker Street, suggesting that a slight alteration to critical turning movements at the Ruggles Street/Parker Street intersection during peak volume periods may result. Specifically, Ruggles Street southbound left turn movements at this congested

location would be reduced, potentially providing for marginally improved operations at peak hours. The existing curb-cut on Parker Street will be maintained for access to the redesigned Triangle lot. No additional access via a curb-cut on Ruggles Street will be provided.

C. Ruggles Street Entry Redesign

A redesign of the existing faculty, employee and visitor vehicular access point on Ruggles Street to provide for a pair of one-way access lanes will generate no additional vehicular trips, but will instead provide for safer and more efficient vehicular movement along the congested segment of Ruggles Street between Huntington Avenue and Parker Street. At present a two-way access lane for these campus users is located on Ruggles Street approximately 50 feet to the south of Huntington Avenue, creating conflicts for both pedestrians and vehicles due to turning movements to/from this access point during peak arrival and departure periods on-campus. The pair of replacement one-way access lanes will be symmetrically aligned with the Ruggles Street facade of Wentworth Hall, incorporating a two-directional connector road along the Wentworth Hall facade, providing vehicular access to both West Lot and East Lot. West Lot is presently accessed via Ruggles Street, and access would be maintained but relocated by this proposed project. East Lot, however, presently is accessed only by Parker Street. Upon implementation of the redesign of the Ruggles Street entry East Lot could be accessed from both Parker Street and Ruggles Street.

Implementation of the entry redesign on Ruggles Street is particularly pertinent in light of the proposed roadway widening project of this roadway jointly sponsored by the MBTA and the City of Boston. This project would widen to a uniform four lanes the entire length of Ruggles Street between Huntington Avenue on the north and Tremont Street on the south. Funding difficulties have delayed implementation of this construction project indefinitely. The current design of the project specifies that the bulk of the widening will take place at the western edge of the road's right-of-way, and all proposed campus access improvements on Ruggles Street at Wentworth Hall will provide sufficient frontage to insure that the widening project will not be constrained. It would be desirable to coordinate the two projects to allow construction of the access improvements and the Ruggles Street widening to coincide to the extent possible.

D. Edwards and Rogers Hall Study

A study of the renovation potential of the existing 212-bed Edwards and Rogers Hall on Huntington Avenue will have no traffic impacts. If the study recommends the replacement of Edwards/Rogers by another housing facility on-campus, no change in traffic would be expected. Whether the existing facility is renovated or

replaced, no additional beds above the existing 212 are presently contemplated by the Five-Year Plan. However, in the long term increases in on-campus housing may positively benefit traffic conditions by reducing commuter student vehicle trips. Alternatively, if the study reveals renovation to another Institute-related use is desirable, to the extent it served existing campus population, no additional trips would be generated.

E. West Lot Pedestrian Improvements

Pedestrian circulation improvements via well-defined walkways, lighting, signs and landscaping within the West Lot, and potentially with connections to Huntington Avenue via land of the Mass College of Art, will improve pedestrian connections between Institute property to both the north and south of Huntington Avenue. These measures will encourage pedestrians to cross Huntington Avenue at signalized crosswalk locations at Huntington Avenue/Tetlow Street or at Huntington Avenue/Ruggles Street/Louis Prang Street instead of at the midblock point between these two intersections, which is presently used by both students and other community residents for illegal crossings. These pedestrian improvements will help in alleviating the vehicular-pedestrian conflicts which currently characterize the segments of Huntington Avenue in the vicinity of the Institute.

The removal of on-street parking spaces on Parker Street along the front facade of the Annex complex will also improve existing vehicular-pedestrian conflicts in this high-volume pedestrian crossing area. The existing situation in which pedestrians cross Parker Street between parked vehicles would be eliminated and improved sight lines for both pedestrians and for vehicle operators would be afforded.

F. Decommission Halleck Street and Mindoro Street

The proposed decommissioning and acquisition from the City of Halleck Street and Mindoro Street between Station Street on the west and Prentiss Street on the east will have no traffic impact on circulation in the neighborhood because both streets are principally used to access the parking lots leased by MASCO, and otherwise carry insignificant volumes of through traffic. Decommissioning of these streets would allow Wentworth to consolidate its land holdings to the south of the Parker Lot, and to potentially expand the available parking supply on these parcels with relocated lot access points to Prentiss Street and/or Station Street.

G. Building Renovations

The renovations proposed for the Ira Allen Building and Beatty Hall will have no influence on existing traffic patterns.

The Five-Year Plan includes the following policies and programs to address traffic issues.

1. Wentworth will continue to encourage the reduction in vehicle trips to campus by increasing mass transit ridership by faculty, staff and students through consideration of a subsidized T-pass program, coordinating and advertising carpooling and ridesharing information, and balancing supply/demand and pricing policies so as not to inappropriately encourage driving to campus.

2. Wentworth supports the removal of a certain number of public on-street parking spaces along Parker Street near the Ruggles/Parker intersection to assist in the improvement of the operating conditions of the intersection.

3. Wentworth supports areawide traffic management studies by the BTD/BRA and will cooperate by providing information generated by the Institute.

4. Wentworth will continue to monitor the progress of the widening of Ruggles street with City and MBTA staff to coordinate campus access improvements to the extent possible.

Campus Parking

Existing Conditions

A. Parking Supply

The existing parking supply on the Wentworth campus serves faculty, staff, students and visitors. In addition, the Institute leases spaces to the Medical Area Services Corporation (MASCO). Currently, there is a total of 1,159 parking spaces on property owned by Wentworth, 768 of which are used currently by the Institute and the remaining are either leased spaces for MASCO (260 spaces) or in lots which are presently closed to use (131 spaces). *Figure 25* displays the locations of existing campus parking facilities.

All of Wentworth's parking supply is located within surface parking lots and all lots require parking permits. Currently, none of the lots are gate controlled. Most lots are controlled by an attendant with Beatty, East and Parker Lots being the exceptions. Besides the lots leased to MASCO, all lots are paved and striped for individual parking spaces. The parking lots leased by MASCO are served by a shuttle bus to the Longwood Medical Area operated by MASCO.

The parking system does not assign specific lots to students or faculty/staff. Therefore, lots proximate to the campus core are fully utilized and lots nearer to the campus edge are underutilized. Students are permitted to park in all Wentworth lots, excepting West Lot and Beatty Lot. Both of these lots are reserved for faculty and staff parking. Faculty and staff, however, are allowed to park in any of the lots. In addition, West Lot provides a designated area for visitor parking.

Table 5 identifies the key features of the parking supply on Wentworth property.

Table 5. Existing Parking Supply

Lot	Parking Spaces	User Group	Attendant	Paved	Striped
Institute Lots					
Baker	110	Students	Yes	Yes	Yes
West (Faculty/Staff)	216	Fac./Staff	Yes	Yes	Yes
West (Visitor)	27	Visitor	Yes	Yes	Yes
Beatty	22	Fac./Staff	No	Yes	Yes
East	46	Students	No	Yes	Yes
Annex	156	Students	Yes	Yes	Yes
Triangle	191	Students	Yes	Yes	Yes
Sub total	768				
Leased to Others					
MASCO	260	Medical	Yes	No	No
Closed Lots					
Parker	131	Students	No	Yes	Yes
Total	1,159				

It should be noted that the 191-space Triangle Lot was, until the Fall semester of the 1990-1991 academic year, leased to Children's Hospital for parking. Children's was at that time constructing a parking garage, which has since opened to use, and has relinquished their lease with Wentworth. Wentworth opened the Triangle Lot to general campus parking, and accordingly closed to use the 131-space Parker Lot.

Museum School

Museum of Fine Arts

Mass. College of Art

Huntington Ave.

Fire House

Baker 110

West 216

Visitors 27

triangle 191

M.W.R.A.

East 46

Church

Northeastern University

Mission Hill Main Housing

Beatty 22

Annex 156

Alice Hayward Taylor Apts

(Closed)

Southwest Corridor Park

MASCO 260

Madison Park Campus High School

Wentworth Institute of Technology

Boston Campus Master Plan

Existing Parking Supply
Figure 25

0 100 200 400

Faculty, Student, Staff Parking

Parking Lots Leased to Others

Sasaki Associates, Inc. *Campus Planning & Design*

Anthony Blackett *Space Programming*

McDermott / O'Neill & Associates, Inc *Development Consultant*

April, 1991

On-street parking spaces are also used by members of the campus population. Non-metered parking adjacent to campus is available along Parker Street, Annunciation Road, Ward Street, Evans Way, Edgar Street, and Tavern Road. Metered parking is available along Huntington Avenue and streets off of Huntington Avenue such as Museum Road and Tetlow Street. On-street parking is not allowed on Ruggles Street.

The on-campus parking supply (including the Parker Lot) was surveyed on Wednesday, October 4, 1989 during the 10:30 to 11:30 AM time period to determine peak occupancy of campus parking spaces. National experience at institutions of higher learning has shown that parking demand grows gradually through the morning, peaking around 11:00 AM, and gradually declining through the afternoon. *Table 6* documents the results of this survey for each parking lot. Data related to current (i.e., 1991) peak occupancy of the Triangle Lot has been included in the survey results, as well, to reflect Wentworth's use of the lot since the fall of 1990.

Table 6. Peak Parking Occupancy

Lot	Parking Spaces	# Spaces Occupied	% Spaces Occupied
Institute Lots			
Baker	110	89	81
West (Faculty/Staff)	216	208	96
West (Visitors)	27	15	56
Beatty	22	25	114
East	46	48	104
Annex	156	154	99
Triangle	191	191	100
Sub total	768	730	95
Leased to Others			
MASCO	260	239	92

Closed Lots (open when 1989 survey was conducted)			
Parker	131	49	37
Total	1,159	1,018	88

Table 6 indicates that those lots used by Institute students, faculty and staff operate during peak occupancy periods at 95 percent of capacity. This includes the Triangle Lot which was only recently made available to Institute affiliates. At 90 percent occupancy, a given lot is generally considered to be at its "functional capacity". Thus, the Institute lots are presently operating above their functional capacity and should be considered full.

Institute lots that operate below their functional capacity include the Visitors portion of West Lot and Baker Lot. Beatty Lot and East Lot, which are relatively small lots, operate above capacity, as evidenced by vehicles parked in unmarked spaces. These lots are also the most conveniently located to the academic/administrative core of the campus. West Lot and the Annex Lot essentially operate above functional capacity (i.e., 96 percent and 99 percent of capacity, respectively). The Parker Street Lot (now closed) was an exception and was found to be only lightly used as it was perceived to be the least convenient and secured lot on campus.

B. Campus Parking Permit Issuance

All of the Institute operated lots, which currently have a total of 768 spaces, require parking permits. In the Fall of 1989, the Institute provided faculty and staff with 322 parking permits and day students/resident students with 493 parking permits and visitors/contractors with 39 permits. This totals 854 parking permits which could be used during the day. An additional 770 permits were sold for evening and weekend use only. *Table 7* documents the number of permits issued to each user group.

While the total number of daytime permits exceeds the parking supply by approximately 86 permits, three factors must be considered. First, a certain number (unknown) of faculty/staff permits are for evening faculty use and would not be used during peak occupancy periods during the day. Second, a portion of the parking spaces will be shared (i.e., turned over) during the day, allowing a single space to provide for more than one parking permit. Third, use of individual permits is not likely to occur every day. These factors reduce the daily use of permits and resultant demand for parking spaces.

Table 7. Parking Permits by Group, Fall 1989

User Group	Permits Issued	Population	Percentage
Faculty/Staff	322	330	99
Commuter Students			
Day	475	1,940	25
Evening	420	442	95
Weekend	355	545	65
Resident Students	18	902	2
Visitors and Contractors (daily)	39	--	--
Total	1,608		

Current policy at Wentworth is to issue permits, if possible, to all Institute-affiliated persons who request one. Thus, the total number of permits issued is a good indicator of total parking demand. However, an exception to this is demand for resident students for whom parking permit approval is severely restricted (i.e., a total of 18 permits are issued). In addition, because there is a charge for a parking permit, some number of individuals will choose not to purchase a parking permit and instead seek parking in other locations.

Each fall, the Public Safety Office issues approximately 410 permits to day commuting students and then closes sales. Parking lots are observed for occupancy over a week's time and then sales are reopened on a first-come first-served basis. All 65 students that requested a permit under the second phase of sales in 1989 obtained one, as there were determined to be available parking spaces.

Parking permit rates, on an annual basis, range in cost from $80 for evening and weekend students to $420 for overnight (resident students), as follows:

- Faculty and Staff - $190/year
- Day Students - $150/year
- Evening and Weekend Students - $80/year
- Resident Students - $420/year
- Contractors - $225/year

The above rates for both day students and evening and weekend students reflect decreases since 1989. Permits for day students have decreased in fee from $210 per year, and for evening and weekend students have decreased in fee from $106 per year. These decreases in permit fees result from a desire on the part of the Institute to encourage students who already drive to campus to park in Institute lots rather than on neighborhood streets.

C. Modal Split and Geographic Distribution

In the Fall of 1989, a mail survey of all faculty, staff and commuting students was conducted. The goals of the survey were to gain insight into what modes of transportation people took to campus, where they came from, and if they drove, where they parked. Approximately 70 percent of the faculty/staff responded and 24 percent of the commuting students responded.

With regard to the student survey responses, the 24 percent sample is not as high a response rate as would be desired for a high level of confidence in the results. In addition, the survey was mailed and many were returned because the student's address had changed. Thus, is likely that the results were skewed toward those students who have a more permanent home address and who drive to campus from locations further away. Further, since no differentiation was made in the responses between day and night/weekend students, it is not possible to determine the exact patterns of travel and modal splits for day commuting students and the extent to which the results were influenced by evening/weekend students.

With regard to modal split, among the student respondents 76 percent indicated they drive to campus and 17 percent take some form of public transit. Responses of motorcycle, bike and taxi access represented less than one percent of the total responses. Students who took the bus were very likely to access campus via Ruggles Street Station, as 14 bus routes serve that facility.

Faculty respondents indicated that 76 percent drive and 18 percent take a form of public transit. Affirmative responses to motorcycle, bike and taxi modes represented less than one percent of the total responses. *Table 8* shows the results of the survey for mode of travel to campus.

Table 8. Mode of Travel to Campus

	Response Percentages						
User Group	Drive	Passenger	Green Line	Orange Line	Bus	Walk	Other
Students	76.4	1.3	9.4	6.3	1.4	1.3	3.9
Faculty Staff	75.7	1.8	8.1	4.1	5.4	3.2	1.7

With regard to geographic distribution, the town/city and associated zip codes of respondents to the survey were grouped geographically. A map documenting that grouping system is located in the Inventory Report (December 1989). The results indicate that most commuting students come from locations West or North of campus with significantly fewer respondees coming from the Central area (generally including in-town neighborhoods of Back bay, South End, Center City, Mission Hill, Fenway and Roxbury).

Faculty and staff had a more evenly distributed pattern than student respondents. The highest percentage of faculty/staff respondents came from areas to the North of campus. *Table 9* indicates the geographic split represented by the survey responses.

Table 9. Geographic Distribution of Commuters

	Response Percentages					
			North		South	
User Group	Central	North	West	South	West	West
Students	5.7	21.0	16.4	19.4	13.0	24.4
Faculty/Staff	13.5	20.7	14.0	16.2	18.9	16.7

With regard to parking location, the survey results indicated that virtually all faculty and staff who drive to campus also park in Wentworth lots. Student responses indicated that of those who drive, 66 percent park in Wentworth lots and 27 percent park on public streets. *Table 10* documents these results.

Table 10. Parking Location

User group	Response Percentage W.I.T. Lot	Public Street	Other
Students	65.6	27.3	4.9
Faculty/Staff	99.4	.6	--

In summary, about 76 percent of Wentworth's overall commuting population indicated they drive to campus, and less than 20 percent indicated they use some form of public transit. While this percent is thought to be accurate for faculty and staff, given the skew of the survey for student respondents, a significantly lower percentage of students are believed to actually drive to campus. This is, in part, supported by the number of parking spaces provided and demand indicated by permit requests.

Ridesharing/carpooling was not revealed to be a major commuting characteristic. The predominant directions from which commuter students, approach the campus are from the west and the north. Faculty and staff approaches were similar, although a more even distribution was noted. Virtually all faculty and staff who drive to campus park in Wentworth lots, although about 27 percent of commuting students indicated they park on public streets in the vicinity of campus. Again, since the student response rate was low and skewed, this split is not believed to be necessarily accurate. Since the parking and traffic survey was taken in 1989 two factors have changed that have likely altered the actual modal split and parking characteristics. First, the Triangle Lot was opened for Wentworth affiliate parking and the Parker Lot was, in turn, closed. This provides more spaces (191 vs. 131) in what is perceived to be a more convenient and secure location. As a result, it is expected that more students park in Wentworth controlled lots. Second, Wentworth has recently decreased the cost of a student parking permit and this is thought to also contribute towards an increase in students parking in Institute lots versus on public streets or elsewhere.

Potential Effects Of Five-Year Plan On Campus Parking Supply

New parking demand on the Wentworth campus is not projected to occur as a result of the Five-Year Plan elements. Improvements and/or changes to campus facilities as part of the Five-Year Plan are driven neither by student enrollment nor faculty increases. Enrollment and staff/faculty employment opportunities are projected to stabilize at current levels. Specific potential effects on campus parking provision of the elements of the Five-Year Plan include:

A. **CDC Renovation/Addition**

Renovation and expansion of the Annex Complex containing the College of Design and Construction will not result in additional parking demand generation, and neither will the expanded CDC facilities displace any of the existing parking supply of 156 spaces in the Annex Lot.

B. **Recreational Field Development on Triangle Parcel**

Development of recreational/athletic fields on the Triangle Parcel will displace all but 40 of the existing 191 parking spaces on this parcel which are all occupied at peak use. The existing demand for the remaining 151 parking spaces are proposed to be met through the re-opening of the 131-space Parker Lot (which was used by Wentworth affiliates until the fall of 1990), and through use of available spaces in Baker Lot which currently has an estimated twenty spaces available at peak use. No new parking spaces are proposed to be developed as part of this element of the Five-Year Plan.

C. **Ruggles Street Entry Redesign**

Development of a re-designed campus access point on Ruggles Street will have no impact on parking demand. As proposed, the project will not displace any existing parking spaces in either the West Lot or the East Lot.

D. **Edwards and Rogers Hall Feasibility Study**

A feasibility study of Rogers/Edwards Hall for residential or other purposes is projected to have no impact on parking demand related to this facility during the Five-Year planning period. However, should the Institute determine that this facility should be used for an institutional purpose other than student housing, parking demand would need to be reevaluated at that time. That evaluation would include analysis of whether the new use represented an expansion or addition to faculty, staff or students or whether the proposed use served existing campus populations.

E. **West Lot Pedestrian Improvements**

The introduction of a well-defined pedestrian walkway across the West Lot will initiate a certain amount of reorganization and redesign of a portion of the parking lot. In terms of parking supply, the goal of the project will be no substantial net loss of the total number of spaces currently provided in West Lot.

F. **Decommission of Halleck Street and Mindoro Street**

The proposed decommissioning of Halleck Street and Mindoro Street will have a modest positive affect on parking on the Wentworth campus. To the degree that closure of these streets will allow consolidation of property between Station Street and Prentiss Street, the potential for modest improvements in capacity, landscaping, lighting and security of parking areas now leased to MASCO are possible.

G. **Building Renovations**

The renovations proposed for the Ira Allen Building and Beatty Hall will have no influence on existing parking patterns. Both projects serve existing on-campus populations.

Wentworth supports the removal of on-street parking spaces along most of Parker Street between Ruggles Street and Annunciation Road. The goal of this removal is two-fold. First, the safety of pedestrian crossings to and from the Annex are improved considerably. Second, the removal of parking can also assist in the improvement of the operating conditions of the Ruggles Street/Parker Street intersection by increasing the available street cross-section on the approach to this signalization intersection. The estimated loss of public on-street spaces that would result is 65 spaces. Of those, approximately 45 would relate to improving pedestrian crossing and 20 spaces would address the Parker/Ruggles intersection.

The Five-Year Plan includes the following policy and program initiatives by Wentworth to address overall Institute-related parking demand and to reconcile the potential loss of a portion of the public on-street parking along Parker Street.

1. Wentworth will encourage participation in carpooling and ridesharing providing centralized information and support materials to all campus populations.

2. Wentworth will improve the site conditions at the Parker Street Lot by upgrading lighting, fencing and signage to address perceived convenience and security issues with this lot by Wentworth affiliates.

3. Wentworth will continue to monitor pricing policies for Institute operated parking to ensure that Wentworth affiliates fully use Wentworth operated lots in lieu of on-street parking and so as not to encourage the use of private automobiles. This includes the pricing policies for Saturday parking in Wentworth Lots.

4. Wentworth will consider the initiation of a T-pass subsidy program to increase transit ridership by faculty, staff and students and decrease overall parking demand.

5. Wentworth will continue to lease land for MASCO parking in recognition of the areawide role of this satellite parking facility.

6. Wentworth will annually review parking conditions and incorporate information into the annual update of the Master Plan.

Wentworth Institute of Technology has a long term commitment to its dual institutional roles as educator and community member. Over the past several decades, the Institute has actively reached out to the Greater Boston community and its host community of Mission Hill, with a focus on supporting local efforts and developing programs for youths to improve their math and science skills, while fostering an interest in the fields of engineering and technology. In addition to providing many opportunities for local youth to make use of its athletic facilities, Wentworth takes a special interest in youth programs which foster academic interests. The Institute also actively participates in the development and implementation of retraining programs for those already in the workforce, to provide them with opportunities to upgrade their technological skills and keep pace with the changing work environment.

The development and implementation of community programs have been accomplished through collaborative efforts and partnerships which Wentworth has entered into with a number of institutions and groups over the years, including: the Boston Housing Authority, the Boston Public School system, area hospitals and institutions of higher learning, private corporations, the Bay State Skills Corporation, and members and representatives of the Mission Hill community.

Programs for Community Youth

In working with youths, Wentworth has focused its efforts on developing and supporting educational programs that foster basic skills and promote an interest in engineering and technology. They include after-school programs, weekend activities, and summer programs. Specific programs that Wentworth has participated in and sponsored over recent years and those currently in the process of implementation include:

Elementary and Middle School Programs

- *Computer Mentor Program* - Jointly developed and funded by Wentworth and the Boston Housing Authority, Department of Public Safety, this program is currently in its third year. Youths ages thirteen to sixteen who are residents of Boston Public Housing attend a series of seven Saturday morning programs at the Wentworth Computer Center. Wentworth provides the students with breakfast and support from its faculty. The youths receive an exposure to and develop a familiarity with computers. Additionally, they are afforded the opportunity to experience an important glimpse of college life. The computer mentor program was recently cited by H.U.D. as one of fifteen outstanding youth programs nationwide.

- *Summer Camp in Applied Technology* - Wentworth has received outside funding from grants and foundations to conduct a summer camp for elementary school students in partnership with the Boston Housing Authority, the Federated Dorchester Neighborhood Association and several Boston public schools. The camp's first session will be held in the summer of 1991 for third grade students. The program will be expanded in the future, to include fourth and fifth grade students.

  The objective of the program is to stimulate students' interest in engineering and technology at a young age, while demonstrating practical applications of math and science skills. As part of the four-week camp's curriculum, students will participate in laboratory projects in manufacturing, computer science, mechanical engineering, civil engineering, and electronics. Structured athletic programs in baseball, volleyball, basketball and swimming will balance academic activities. Field trips to area museums and businesses will afford students opportunities to expand their horizons as well.

  Wentworth and the Boston Housing Authority are currently seeking funding for the development of a winter component of the Applied Technology program.

High School Programs

- *MassPep (Massachusetts Pre-Engineering Program)* - Wentworth has worked with the founders of MassPep since the program's inception in 1979 and serves as the program's host, by providing it with administrative office space on the Institute's campus. The MassPep program focuses on minority students from Boston and Cambridge with a demonstrated aptitude for engineering, and seeks to foster their interest in careers and training in the fields of engineering and technology, while simultaneously strengthening their math and science skills. After school and summer camp programs are conducted and workshops are held on topics such as Robotics, PC Lab, Engineering Lab, Science, Mathematics and AutoCAD.

  In the 1990 academic year, 460 high school students and 140 middle school students participated in MassPep. The middle school program is a recent expansion of the MassPep curriculum, with 100 students using Wentworth labs on Saturdays to improve their math and science skills.

- Beginning in 1989, Wentworth has hosted the annual "*Women in Technology*" conference, sponsored by New England Telephone. Last year, the conference was attended by approximately eight hundred high school women. Presentations are given on careers in science and technology and students are advised of the academic requirements that are necessary to reach these careers. The conference also includes a job fair with local employers in the fields of engineering and technology represented.

- *The Flexible Campus Program* - The Flexible Campus Program was recently developed by Wentworth in conjunction with Boston Technical High School. Through the program, each academic year approximately twenty students in their senior year at Boston Technical are able to spend their final semester taking courses at Wentworth. The program began in the spring of 1990, and Wentworth provided full funding for the students' tuition in that initial year. The Arthur D. Little Corporation and the William and Bertha Schrafft Charitable Trust are co-sponsors of the program.

  The Flexible Campus Program provides these gifted students with a head start on a college education as well as the social and cultural experience involved in attending a college, in an effort to ensure their continued interest in higher learning.

- *New Beginnings* - The New Beginnings program is sponsored by Roxbury Community College and has been in operation since 1987. It is an upward bound type program for inner city high school students. The summer session, which is a residential program held on Wentworth Campus, provides students with a social/cultural opportunity to broaden their experience, and assists in developing in these young students an interest in continuing their education.

- *Boston Technical High School Program* - This four-year-old program originated at Umana High School and has since moved its operations to Boston Technical High School. Through the program, students produce a newsletter for parents and learn about math, physics and publishing in the process. Wentworth and Boston Technical faculty provide students with advice and assistance in the process. The program is supported by federal 636 funds, earmarked to go to the City to enhance minority retention.

- *Mission Hill/Wentworth Academy* - The Mission Hill/Wentworth Academy is a program recently developed by Wentworth and introduced in the summer of 1990. Eighty ninth, tenth and eleventh grade students from Mission Hill participate in this summer camp program which combines academics and athletics. Students' math skills are strengthened while they also have the opportunity to participate in basketball programs. The overall objectives of the program are to improve students' self-esteem, while improving teamwork skills and creating an understanding of opportunities for careers in engineering and technology.

  Wentworth awards two students with a $400 scholarship at the end of the program, based on academic and athletic criteria.

- Wentworth has participated in a Historic Neighborhood Foundation program in which students from Boston Technical and Boston English high schools are assigned a design problem for their neighborhoods and are given instruction by Wentworth faculty on fundamentals of design and mathematics.

- *Boston Area Youth at Risk* - This program was developed in 1984, in collaboration with the Boston Housing Authority, Department of Public Safety. Through the program, youths from public housing adjacent to Wentworth's campus are invited to use the campus sports and recreational facilities.

- An annual Computer Programming Contest is conducted by Wentworth for local high schools and is run by Wentworth students and faculty in the Computer Science/Mathematics Department. This year, sixteen high schools participated.

Community College Programs

- *Cross Registration* - Wentworth has an ongoing relationship with Roxbury Community College, and over the past several years the two schools have collaborated on a variety of community educational programs for middle school and high school students. Since 1984, Wentworth and Roxbury Community College have also had a cross registration program, which provides RCC students with opportunities to take courses at Wentworth. The program enables RCC students to become familiar with the four-year college experience and facilitates transfers in order for them to pursue a baccalaureate degree. Funding for this program has been shared by the two schools in the past, and has recently been taken over by Wentworth in order to continue the program despite decreases in Roxbury's public education funding.

Employment and Retraining Programs

- *Pneumatic Scale Corporation* - Wentworth developed and implemented an intensive two year program for workers at the Pneumatic Scale Corporation in Quincy, Massachusetts, in conjunction with the Bay State Skills Corporation and the Mechanical and Allied Production Workers Union Local 444 AFL-CIO. The program was funded by the Bay State Skills Corporation and the Pneumatic Scale Corporation. Participants in the program were mechanical assembly line workers who were cross-trained in manufacturing processes in order to facilitate a change over to more modern electronic production techniques. This program has become a model retraining program.

- Massachusetts Water Resources Authority - Wentworth designed and implemented a program funded by the MWRA, which provided mechanical workers at the MWRA with necessary skills for changes in the technology involved in their jobs, particularly in the area of basic electrical circuits and calculations. Additional programs are currently being planned.

- *Boston Edison Company* - Wentworth has worked with Boston Edison to develop and implement a technical training program for Edison's field inspectors. The program is designed to train workers to be familiar with Boston Edison's exact technical specifications.

- *Project Strive* - Wentworth Institute is a collaborative partner in the Boston Public Schools Special Education Program called Strive -- Supported Training to Reach Independence through Vocational Experiences. This model program assists high school students with moderate-to-severe special needs, either physical, emotional or intellectual, in making the transition from the classroom to the workplace. These students are given the opportunity to enter the work force in supervised positions, the first step to an independent, productive life.

  As part of this program, Wentworth hires students with special needs for supervised part-time paid jobs on the Wentworth campus, in positions such as grounds custodians, dining hall workers, and data entry clerks.

- *Project Strive Recycling Program* - Wentworth is currently working with the Boston Public Schools on a pilot program involving recycling. In addition to their studies, high school students with special needs come to Wentworth, collect recyclable materials, and prepare it for purchase by a refuse removal company. These students are then paid wages with the money received from the refuse removal company for the recyclable material. The program enables these students to have an income while they participate in training programs for future careers, while also developing important social and professional skills.

Other Community Benefits and Participations

- *Boston Fenway Program* - Wentworth is an active member in the Boston-Fenway Program, an organization comprised of some sixteen educational and cultural institutions. Through member financial and operational support, the Program conducts many activities including maintaining the Fens and Evans Way Parks, initiating public safety programs (patrol organizing), coordinating a Student Conduct Steering Committee and conducting regular member meetings.

- *Security* - Wentworth employs its own security force to patrol its campus and environs. Due to the urban nature of the campus, the security force also monitors the adjacent public streets. Strategic lighting of walkways, streets and buildings also contribute to the overall security of the campus and environs.

- *Neighborhood Maintenance* - In the course of maintaining campus properties, Wentworth makes a concerted effort to clean city sidewalks, curbsides and catch basins adjacent to campus properties. Through its support and participation in the Boston-Fenway program, Wentworth contributes the maintenance and upkeep of the Fens and Evans Ways Park.

APPENDIX

Appendix A. Academic Program and Enrollment

Introduction

This report defines the existing programmatic space use of the Wentworth Institute of Technology's Boston campus. The sufficiency and efficiency of current space is analyzed and is compared to other institutions where relevant. Enrollment projections are identified and analyzed in terms of their space implications.

Finally, Appendix III includes notes of the series of meetings held with the chief officers of the Institute regarding current and future programmatic and space needs.

The information on space shortfalls (or surpluses) and future needs will be consolidated into a space development program in the next phase of this project.

Description of Institute

Wentworth Institute of Technology was founded to teach engineering technology - '...the discipline of applying engineering to real situations, real products, and real problems.'[1]

The Institute is composed of four divisions:

College of Design and Construction (CDC)
College of Engineering & Technology (CET)
College of Arts & Sciences (CAS)
Division of Management Science (DMS)

Of these, CDC and CET constitute over 90% of the Institute's enrollments.

The total enrollment for fall of 1989 is 4,021[2]. Of these, 3,034[3] (75%) are day; 442 are evening (11%); and 545 (14%) are weekend.

The Institute is located on two campuses: Boston (main campus) and the Plainville campus (field components of CDC programs). In addition, facilities are used at Hanscom Field and in Waltham (aeronautical programs and Sylvania Tech). This report addresses the Boston campus. The remote facilities are only of concern insofar as they might be used for relocation of functions or uses in Boston.

The Boston campus is 29.5[4] acres. The total building areas are[5]: student housing - 171,385 gsf; non-housing - 509,551; and storage (building no. 19) - 19,504 gsf.

Enrollment Projections

The demographic reality facing all institutions of higher education is the decline in high school graduates in the 1990s. This will be particularly acute in the Boston metropolitan area, where the decline in this cohort of WIT's major draw areas will be up to 40%. The decline will be offset beyond the turn of the century by an increase in high school graduates to around the current level, although the proportion of minorities - and again especially in Boston - will be considerably larger. The common strategy of institutions is to assume a steady state enrollment for the 1990s on the basis that any shortfall in high school graduates will be made up by increasing enrollments of non-traditional students e.g. older students, professional training, continuing education etc., and increasing the draw form minority students.

The total daytime enrollment over a ten year period is[6]:

1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
2481	2734	3008	3248	3286	3189	3190	3124	2816	2961

The figures show an overall increase in the ten year period of approximately 20%, although the years of 1981 to 1986 show a higher increase. The dip in enrollments over the last year or two, probably reflects the decreasing demographic pool of high school students.

The Provost's Office at WIT have made a five year enrollment projection[7]. The relevant projections are include in the table below. Only daytime enrollment figures are used since evening and weekend enrollments - although projected to increase at a faster rate than daytime enrollments - have little or no bearing on space use as these students effectively make double use of the existing 'daytime' space.

Table 2. Enrollment Projections

Program Type	1989	1995	Increase (Decrease)	%Change
Col. of Arts & Sciences				
Pre Technology	26	75	49	189
Technology	173	200	27	17
Special Programs	--	40	40	New
Total	199	315	116	58
Col. of Design & Construction				
Pre Technology	62	75	13	17
Technology	1465	1080	(385)	(26)
Management	69	80	11	16
Professional	163	240	77	47
Graduate	--	20	20	New
Special Programs	21	40	19	90
Total	1780	1535	(245)	(14)
Col. of Engineering Technology				
Technology	766	875	109	14
Professional	--	75	75	New
Special Programs	--	65	65	New
Total	766	1015	249	33%
Dept. of Management Science				
Technology	-	50	50	New
Management	20	75	55	275
Special Programs	5	40	35	800
Totals	25	165	140	560%
Col. of Cont. Education				
Special Programs	--	40	40	New
Grand Totals	2775[8]	3070	295	11%

Comments on table:

- The total enrollment projections for 1989 (i.e. inclusive of evening and weekend) were 3140, and for 1994 are 4500 - an increase of 43%. Since the day increase is projected to be only 11%, this indicates that the majority of increase will be in the evening and weekend divisions i.e. non-traditional students.

- The greatest shift will be from Design and Construction (decline of 14%) to Engineering Technology (increase of 33%).

- Aside from Engineering Technology, the most significant increases will be in Management and Special Programs.

There will be little or no space implications to the proposed shifts in academic enrollments, since:

- At its peak, the enrollment of he College of Engineering and Technology was 44% larger than its current enrollment[9]. The larger enrollment was taught in the current space. Enrollments have declined; the space has not. Thus an increase of 33% should be readily absorbed.

- On the assumption that there is some spare classroom capacity, it may be possible to absorb increases in Management and Special Programs enrollments with the current facilities (especially if the Annex renovations proceed as planned) since these programs - especially Management - are largely dependent on classroom facilities.

Space and Utilization Analysis

Appendix I to this section includes a detailed room by room breakdown of each department (Departmental Space Inventory). In Appendix II, this inventory has, in turn, been broken down into a spreadsheet showing the number of rooms of each type and in each department, the average area for each room type and the average area of office space for the faculty of each department (Wentworth Departmental Analysis). Dormitories are not included in this inventory since residential needs are the subject of a separate analysis. The information was derived from the 'Wentworth Building Room List' provided by the Physical Plant Department. As with any inventory, a few items are out of date or inaccurate. Where the inaccuracies are known, they have been identified.

The data in the 'Departmental Space Inventory' has been consolidated in the following table which shows the total areas of each department and the areas of the constituent room types within each department.

Table 3. Existing Space Inventory

	Total	Office	Lab.	Lab Serv.	Draft Design	Class	Other
Research							
Wentworth Labs	12411	713	3029	7036	1633		
Academic							
Col. of Aeronautics							
Building 6[10]	2681		2681				
Building 21	1596		1596				
	4277	4277					
Col. of Art & Sciences	246	246					
Comp.Sc/Math.	6831	2039	3561	781			
Humanities	2949	2949				630	
Physics	11440	1740	7315	1755		630	

Col. of Eng. Technol.	2860						
Electric./Electron.	24699	2331	13733	5403			
Mechan/Manuf.	34297	4102	27327	2868			
	61856	6433	41060	8271			
Col. of Des. & Const.	1704	1704					
Architecture							
Building 8[11]	4398	2824				1574	
Building 21/23	39545	3875			32070		
Building Const.	7623	726	5682	1035			
Civil	4417	1549	2563	260			
	54087	10678	8245	1295	32070	1574	
Dental Technology	1544	320	832	392			
Administration							
Affirm. Action	126	126					
Alumni	126	126					
Business & Finance	1090	1090					
Com. 308	308						
Act./L.I.F.E.[12]	4646	2491	3723				674[13]
Computer Center	1968	1968					
Col. of Con. Educ.	2705	2705					
Cont. & Bursar	346	346					
Develop. Office	12456	1315					11141[14]
Physical Plant	2378	2378					
President's Office	1156	1156					
Provost's Office	708	708					
Purchasing	1685	1685					
Registrar (admin.)	1319	1319					
Safety & Security	766	766					
Shipping & Receiv.							
	31783	18487	3723				11815
Academic & Institute Support							
Library	20711	1848					18863[15]
Media	1956						1956[16]
Teaching Lab	768		768				
AV Classroom	2722					2722	
Classrooms (Registrar)	60801					60801	
Resource Center	365	365					
Bookstore	119						2860[17]
Cafeteria							
Building 8	20390						20390[18]
Building 24	8951						8951[19]
	116783	2213	768			63523	53020
Student Affairs							
Administration	1110	1110					
Admissions	1078	1078					
Financial Aid	571	571					
Health Services	1390	180					1210[20]
Student Activities	11038	1524					9514[21]

Athletics							
Buildings 8, 9	33453	1766					31687[22]
Building 24	8951	66					8885[23]
							51296
Totals	362874	52113	75670	19530	33703	65727	116131
(Percent)		(14%)	(21%)	(5%)	(9%)	(18%)	(32%)

Comparisons With Other Institutions - Total Area

With a total of 362,874 net sq. ft. (exclusive of dormitories and Building 14), and a day FTE student count of 2,775[24], the space ratio works out to 131 nsf / FTE student. Unfortunately there are no comparative statistics for engineering technology institutions. The following shows statistics for other, but not directly comparable institutions.

1. New community colleges in Massachusetts: 100 nsf / FTE. Community colleges are very roughly equivalent to WIT in space needs since they contain all the same use components with a concentration of technology and drafting labs. WIT has about a third more space than a community college.
2. Small university (e.g. Tufts Medford campus): 147 nsf / FTE. Tufts includes research laboratories for all science and engineering disciplines, which raises the nsf / FTE by a significant amount. Given this, the WIT figures compare very favorably.
3. Northeastern: 67 nsf / FTE. Unfortunately, this figure is not directly comparable with WIT since the FTE figure used (24,000) reflects the coop program whereby a proportion of the students are working off-campus. But even taking the maximum scenario, in which 50% of the students are working, then there would be an effective FTE of 12,000 students on campus and the nsf / FTE would increase to 134 - almost identical to that of WIT. Since it is very unlikely that a full 50% of Northeastern students are working off campus at any one time, it follows that WIT space figures compare very favorably with those of Northeastern.

Although the above comparisons are conditioned by many caveats, it does not appear that WIT has less space per FTE than other institutions, and may even have more.

Comparisons With Other Institutions - Space Type Mix

Again, due to the specialized nature of WIT and its large proportion of teaching laboratories, comparative breakdowns of different space uses are difficult. However, some conclusions can be drawn:

1. Library space can vary between 6% and 15% of the total. At 6.2%, WIT's library is at the low end of the range.

2. And classrooms vary between 5% and 12% of the total. At 18%, it could be that WIT has an excess of classrooms.

Net to Gross Ratios:

The following table[25] identifies the net and gross square feet for all buildings exclusive of dormitory buildings, Building 14 and the remote buildings:

Table 4. Building Resources

Building No.	Net S.F.	Gross S.F.	%Net/Gross
1	5258	12571	42
2	30021	35947	84
2a	9135	11391	80
3	23711	26548	89
4	32830	39569	83
5	15826	21746	73
6	9081	11132	82
7	5217	6605	79
8	79812	103795	77
9	32526	35965	90
10	9391	10170	92
17	9594	11512	83
18	15832	19679	80
21	37060	45732	81
22	31052	41199	75
23	23339	27689	84
24	16359	23031	71
Totals	386044	484281	80

This net square foot total differs from the departmental totals by 4%. Such a discrepancy is not unusual for inventory totals and reflects almost inevitable errors in major data entry exercises. For example, a number of the floor by floor totals in the WIT inventory are inaccurate. The discrepancy of 4%, however, is not enough to invalidate the general conclusions drawn in this report.

The average net to gross ratio of 80% is exceptionally good[26] for an academic institution. The norm varies between 67 and 74%.

space utilization.

Faculty Office Space

The average office space per faculty member is shown in the 'Wentworth Departmental Analysis'. The data is consolidated in the following table:

Department	Average Office Area (Net Sq. Ft.)
College of Arts & Sciences	
Computer Sc./Math.	84
Humanities	99
Physics	87
College of Engineering Technology	
Electrical/Electronics	115
Mechanical/Manufacturing	169
College of Design & Construction	
Interior Design/Facilities Man.	191
Architecture	137
Building Construction	81
Civil	151

Note: in calculating the above areas, faculty 'on leave of absence' have not been included.

The proposed program for the College of Design & Construction establishes offices 100 nsf per faculty member. This is a perfectly reasonable standard and if it is used as a yardstick for the above figures, then it can be seen that CAS is short of office space and CET is in excess. The existing CDC figures are moot, since the entire Annex is planned to be renovated with the proposed program for the CDC.

Classrooms

The utilization of classrooms is summarized in the following table[28]:

Table 5. Classroom/Lab Utilization

	No. of Units	Total Stations	Stations Used		Total Hours Available[29]	Hours Used	
			No.	% of Total		No.	% of Total
Lecture	37	2211	1187	54	1591	808	51
Labs	41	1273	902	71	1763	713	40
Lab./Lect	20	734	557	76	860	437	51

The generally accepted standards used nationally are compared with those of Wentworth in the following table:

Station utilization	Classrooms	66% of total (Wentworth - 54%[30])
	Laboratories	80% of total (Wentworth - 71/76%)
Time utilization	Classrooms	56-66% of total[31] (Wentworth - 51%)
	Laboratories	44% of total[32] (Wentworth - 40/51%)

Thus, the comparisons show that the Wentworth's station and time utilizations are 4 to 8% below the normative standards (except for the time utilization of the Lab./Lecture which is 7% above). Although the majority of the utilizations are below the standards, the utilization rates compare quite favorably with those of other institutions which are often well below the standards. What the analysis does show, however, is that the current inventory of classrooms and laboratories are adequate for the current enrollment and with a little bit of spare capacity.

Analysis of individual buildings show that the following have low time utilization rates:

Bldg. 2	21%
Bldg. 23	30%
Bldg. 24	38%

This suggests that the Annex (Bldgs. 23, 24) have some spare capacity, which could be used should there be an increase in enrollments.

College of Design and Construction Program

Since a program for the College of Design and Construction has already been established, that program is taken as the 'existing conditions', and as such is briefly analyzed in this section.

The Annex (Buildings 21,22,23, & 24) contain 137,651 gross sq. ft. which currently includes 107,810 usable or net sq. ft.

The draft program for the College of Design and Construction (September 1989) totals 118,350 nsf. It has been proposed that the shortfall of about 10,000 nsf be accommodated by filling in courtyards.(possibly with atrium type space). Alternatively, the program could be reduced by 10% to fit the available space. Such a reduction could possibly be made by reducing the space standards for classrooms, administration and laboratory support spaces, all of which are quite generous; or by a reduction to take into account the projected decline of 14% in CDC enrollments. Whatever the case, however, the current gymnasium and associated kitchen would have to be converted to CDC uses in order to accommodate the program.

The foregoing does suggest that the intent of a physically self-contained CDC within the confines of the existing Annex perimeter is feasible and will satisfy the College's space needs for the foreseeable future.

Library

The basic statistics for the library are:

73,500 BVE[33] (Bound Volume Equivalents)

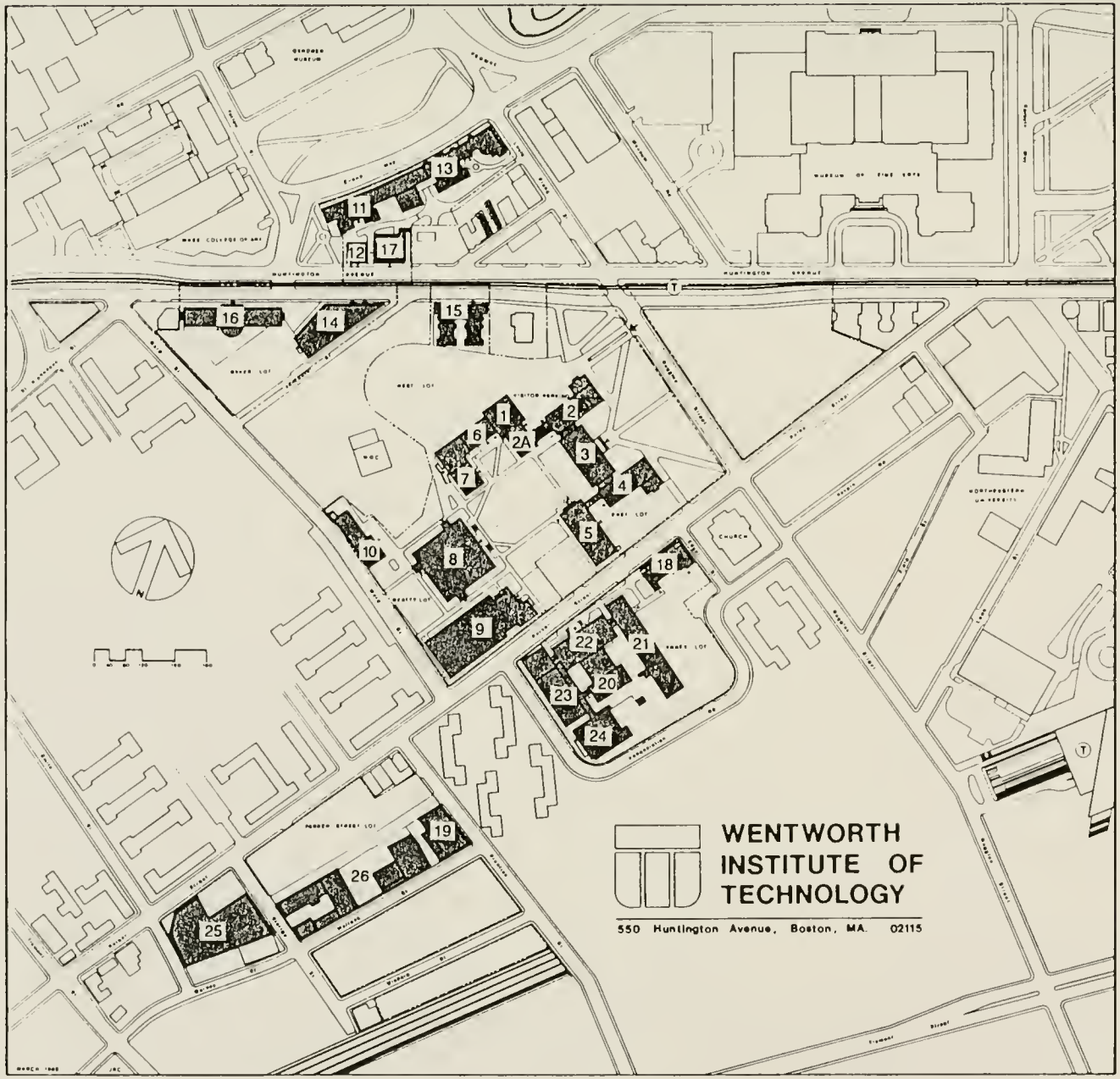
18,900 nsf of stack/reading area

1,800 nsf of support (office and workroom) space

These figures just do not match up to any of the generally accepted standards for college libraries e.g. applying the standards from 'Standards for College & Research Libraries'[34], then the number of BVEs should be over double the number currently possessed by the library; and even assuming the existing number of BVEs, the space requirements would be 32,350 nsf for stack/reading[35], and 4,850 nsf for support (15% of stack/reading area). Wentworth, however, is unique insofar as the library serves primarily technical disciplines and it is part of a networked consortium of libraries in the immediate area; both of these factors would tend to reduce the size of the library as suggested by national standards. Nevertheless, the library falls short of the standards by such a large margin (especially in the provision of study space) that some degree of space expansion for the library would seem necessary.

NOTES

1. President's Introduction, Wentworth Institute of Technology, Vol. XIII 1987-1988, No. 1.
2. Source: Registrar's current enrollment figures.
3. Of these, 186 are on co-op work semester.
4. This figure may be reduced as more accurate site measurements are made from site plans generated for the master plan.
5. Source: Wentworth Building Inventory; the figures are gross square footage (GSF) exclusive of all structural, shaft and partition areas.
6. Source: December 1988 Factbook, Page 32.
7. Source: Student Projections; October 15, 1988.
8. This compares with the actual total for 1989 of 2848 students enrolled in courses (Source: Registrar's data) i.e. enrollment is increasing more than projected.
9. Source: December 1988 Factbook, Page 24 - CET 1984 enrollment of 2003; CET 1988 enrollment of 1394.
10. Currently under conversion to other uses.
11. Certain portions of Building 8 are under renovations which could effect this figure.
12. Scheduled to move to Building 14.
13. Computer facility.
14. Shops and trades.
15. Stacks/reading.
16. Audio-visual equipment storage, maintenance, etc.
17. Display, check out and storage.
18. Dining, serving and kitchen.
19. Kitchen only.
20. Clinic.
21. Recreation and study.
22. Athletic facilities
23. Gymnasium and support.
24. A day student count is used for space utilization purposes since evening and weekend student effectively make double sue of the same facilities. Source for day count is Provost's Office Student Projections, October 15, 1989.
25. Source: Wentworth Building Room List.
26. However, it must be noted that the gross figures used here do not include structural, partition or shaft space which would increase the ratios somewhat - say by 5% i.e. 74%.
27. Building No. 1 also shows an apparently low ratio (of 42%), but this is primarily due to the special use of the building as the central heating plant.
28. Source: Memo. from Reza Razmara to Edward T. Kirkpatrick - 'Space Utilization at Wentworth Campus, Fall Semester, 1989 - dated October 18, 1989.
29. Assumes 43 hour week.
30. The comparison is not strictly accurate since the standard is for the average of each classroom's seat utilization, whereas the Wentworth figure is the percentage utilization for the aggregate of all classroom seats.
31. 25-30 hours of a 45 hour week.
32. 20 hours of a 45 hour week.
33. 69,000 volumes + 4,500 BVE (18,000 items of microfiche/microfilm @ 1 item per 4 BVE). Figures from 1989 Fact Book.
34. College & Research Libraries News 36:299-301, October 1975).
35. 7,350 nsf for stacks (73,500 BVE @ .1 nsf/BVE) plus 25,000 nsf for reading (seats for 25% of 4,000 student population @ 25 nsf/seat).



BUILDING KEY

1. Power Plant
2. Williston Hall
2a. Rubenstein Hall
3. Wentworth Hall
4. Dobbs Hall
5. Watson Hall
6. Kingman Hall
7. Willson Hall
8. Beatty Hall
9. Tansey Gym
   Nelson Rec. Center
10. Service Building
11. Tudbury Hall
12. Collins Building
13. Evans Way
14. Mickelson Hall
15. Edwards Hall
    Rodgers Hall
16. Baker Hall
17. Student Center
18. Ira Allen Building
19. Storage Building
20. Power Plant Annex
21. Annex·North
22. Annex·Central
23. Annex·South
24. Annex·Gym
25. Storage Building
26. Great Eastern Building

SYMBOLS

- ▶ Building Entrances
- ▷ Handicap Entrances
- → Entrance to Visitor Parking
- Ⓣ Public Transportation

BOSTON PUBLIC LIBRARY
3 9999 06316 383 4